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(VOL. I)

NO D2-80084

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CONTRACT REQUIREMENT

This document is submitted in partial fulfillment of paragraph B(1.1.1.9.2) of the Statement of Work, System 620A, Exhibit 620A-62-2, dated 26 January 1962, revised 1 August 1962.

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SUMMARY

This document describes all test work and test results for EWA 5-593 (Reference F).

These tests were conducted to evaluate the strength, flexibility, and sonic and thermal fatigue resistance of superalloy corrugated skin panels and the attachments of non-insulated and insulated panels to primary structures.

Panels with various methods of attachment to primary structure were evaluated. They are identified below, by their respective Booing drawing numbers. Solution treated and aged Rene' 41 was utilized for all panel skins, corrugations, stand-offs, and attachment clip details.

- 25-20352 Two non-insulated panels 23 by 36 inches were fabricated with "omega" groove breathers every six inches running in the 23" direction in an otherwise flat skin. The skin was spot welded to corrugations. Flexible clips on long edges were utilized as the attachment technique. The panels were subjected to cyclic thermal fatigue and combined shear and pressure environments.
- 25-20344-1 Three non-insulated panels 23 by 18 inches, constructed identical to panels 25-20352 except for width, were subjected to sonic tests.
- 25-20369-1 Three insulated panels 23 by 17 inches were constructed with Rene' 41 heat shields substituted for a refractory alloy heat shield. Shield attachment to the corrugations was effected by riveting shields and corrugations to intermediate one inch long stand-off clips. A 0.25 inch layer of Fiberfrax insulation separated the shields and the corrugations. Attachment to primary structure was accomplished by flexible clips on opposite short sides of the panel. These panels were subjected to a somic environment.
- 25-20369-2 Three panels similar to 25-20369-1 except insulation was in-felt and attachment was by direct spot welding of panel to edge beams which were supported on flexible end fittings. Sonic tests were conducted on these panels.
- 25-20370-1 Two non-insulated panels 23 by 36 inches, utilizing shallow protruding beads for expansion in the long direction and for increased skin stiffness in the short direction, were constructed with the skin spot welded to corrugations. This panel was bolted to beams which utilized flexible fittings at corners for attachment to primary structure. This panel was subjected to thermal, shear, and pressure tests.
- 25-20370-2* This panel was the same as 25-20370-1 except that six hat section stiffeners running in the long direction were riveted
 - This is not Boeing part no. 25-20370-2. It is modified 25-20370-1.

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to the corrugation crests to increase panel stiffness. This panel was subjected to thermal and pressure tests.

25-20374

Two 23 by 36 inch panels consisted of corrugations and were constructed to simulate the structural portion of an insulated panel and its attachments under shear and pressure and thermal conditions. Attachment techniques utilized consisted of integral beams on the long sides and flexible fittings at corners.

Thermal tests included symmetrical and unsymmetrical heating at various heating rates to temperatures of 1870° F. Sonic tests subjected panels to 152.5 db overall. Pressure tests were conducted to ultimate load. Shear tests were conducted to induce % inch of shear deflection of the panel across the 23" edge.

Test data are summarized in the form of graphs and tabulated data. Photographs of specimens and test setups are included.

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- B. Drawing 25-20352, Panel Assembly, Uninsulated (Test Only)
- C. Drawing 25-20369, Panel Assembly Lower Surface (Test Only)
- D. Drawing 25-20370, Upper Wing Panel Installation Thermal Cycle (Test Only)
- E. Drawing 25-20374, Panel Thermal Cycle Test, Assembly of (Test Only)
- F. D2-6783-1, Structural Integrity Development and Test Program Detail Plan Structures Technology
- G. D2-80080, Insulated Panel Development Dyna-Soar

- 1.0 INTRODUCTION
- 1.1 Background

This test program was conducted to evaluate non-insulated surface panels and the structural part of insulated panels under simulated conditions of re-entry load and environment. The concept of reliance on high temperature integrity of the panel material for sustained load-carrying capacity under aerodynamic heating distinguishes these structures from those employing cooling techniques. The panels tested were made of heat-treated Rene' 41.

1.2 Objectives

It was required to determine the effects on the panels of noise environments, cyclic heating, thermal gradients, and shear and pressure loads.

- 1.2.1 Sonic tests were conducted on some of the test panels in order to record the behavior of the panels to the environmental sonic conditions encountered in flight. Measurement of sound pressure level and panel motion was required for these tests.
- 1.2.2 A series of thermal fatigue tests, with heat applied to the outer surfaces of the panels producing a temperature gradient across the panel thickness, simulated cyclic re-entry heating. In these attests, observation of damage and measurement of deflection due to differential growth between inner and outer surfaces were required.
- 1.2.3 In other tests the panels were subjected to unsymmetrical heat distribution over the surface, to determine the effects of unequal edge expansion on webs and attachments.
- 1.2.4 The pressure tests were run to obtain ultimate pressure loads at room and elevated temperatures required to cause failure of panel corrugations and/or edge attachments.
- In each shear test, measurement of the load necessary to produce a one-quarter inch shear deformation in the panel web was required, as well as a record of resulting damage.

2.0	TEST SPECIMEN AND INSTRUMENTATION
2.1	Test Specimen, Dwg. 25-20369-1 (Reference, Figure 229).
2.1.1	Three test insulated panels were fabricated with a flat .010" erosion shield with overall dimensions of 23.35" x 17.0". Two grooves running parallel to the 23.35" sides were formed into the shield at 1/3 span points.
2.1.2	Eleven corrugations with a pitch of 1.50" and a .75" depth were formed from a sheet of .008" material.
2.1.3	A sheet of Inconel 200 mesh wire cloth (.002" x 16.2 " x 12.0 ") was installed between the corrugations and $1/2$ " Fiberfrax insulation
2.1.4	The shield wire cloth, Fiberfrax and corrugations were riveted together with Z clip spacer attachments.
2.1.5	Three clips were located at each end of the 17.5" edge for mounting purposes.
2.1.6	The skin, clips and corrugations were Rene' 41 (J 1610) EMS 7-95 material.
2.1.7	Photographs of a typical panel are on Figures 1 and 2, Volume I.
2.2	Test Specimen Dwg. 25-20369-2
2.2.1	Panel 25-20369-2 was similar to 25-20369-1 except for mounting support configuration, use of stabilized Q-felt insulation, and use of Inconel foil instead of mesh. Three test panels were fabricated.
2.2.1.1	One end of the panel was constructed with corner tabs for mounting.
2.2.1.2	Flexible tabs were spotwelded and bolted to the channel in a horizontal and vertical position. These tabs were designed to accept loads only in their respective planes.
2.2.1.3	A metallic foil seal extending outward 1.5" from the panel was attached across the 17.0" ends.
2.2.1.4	A sheet of .004" Incomel foil was installed between the corrugations and stabilized Q-felt insulation.
2.2.2	Photographs of a typical panel are shown on Figures 3 and 4, Volume I
2.3	Test Specimen, Dwg. 25-20344-1 (Reference, Figure 230).
2.3.1	The panel was fabricated with a flat .008" skin which was spot- welded to a corrugated .010" stiffener web. The web had twelve parallel corrugations 0.75" high spaced 1.50" apart.
2.3.2	Overall dimensions were 23.35" x 17.50".

- 2.3.3 Three clips were located at each end of the 17.50" edge for mounting purposes.
- 2.3.4 The skin and corrugations were Rene' 41 (J 1610) BMS 7-95 material.
- 2.3.5 Photographs of the panel are shown on Figures 5 and 6, Volume I.
- 2.4 Test Specimen, Dwg. 25-20374-1 (Reference Figure 231)
- 2.4.1 Panel was fabricated from a corrugated .008 Rene' 41 skin with overall dimensions 23.40" x 35.16".
- 2.4.2 Panel contained 23 corrugations .75" high on 1.50" centers.
- 2.4.3 Formed .030" channel support beams were spotwelded to the corrugations and to .02" clips which in turn were spotwelded to the corrugated panel along the 35.16" sides. Twelve clips per side were used.
- 2.4.4 Tabs were spotwelded to the ends of one support beam, parallel to the 35.16" edge of the panel.
- 2.4.5 A .002" Incomel 702 foil seal was seamwelded around four sides, extending 2.7" beyond the 35.16" sides and 1.6" beyond the 23.40" sides.
- 2.4.5.1 The foil seal was folded and pleated to fit around the corrugations.
- 2.4.6 Seven .02" electronic deflection indicator clips were spotwelded to the panel; one at each corner, one at the center of each 35.16" side, and one at the center of the panel.
- 2.4.7 Three .020" x .50" x 1.0" channels were bolted to the support beams.
- 2.4.8 The corrugations, clips and support beams were Rene* 41 (J 1610) BMS 7-95 material.
- 2.4.9 Photographs of the panel are on Figures 7 and 8, Volume I.
- 2.5 Test Specimen, Dwg. 25-20374-2
- 2.5.1 Fanel 25-20374-2 was identical to panel 25-20374-1.
- 2.6 Test Specimen, Dwg. 25-207.0-1 (Reference Figure 232)
- 2.6.1 The test panel was fabricated with a flat .000" skin with overall dimensions of 23.35" x 30.00". Twenty-three beads, .06" high, and on 1.50" centers were formed into it.
- 2.6.2 Twenty-three corrugations, with a pitch of 1.50" and a .75" depth, were formed from a sheet of .003" material and spotwelded to the beaded skin.
- 2.6.3 Channels, formed of .030 material, were bolted to the 36.00" edges of the panel.

Two .060" attachment plates, one on each end of one channel and 2.6.4 parallel to the 36.00" side, were attached to the channel. Electronic deflection indicator clips were spotwelded to the panel 2.6.5 at six locations. Skin, corrugations, channels, clips and attachment plates were made 2.6.6 from Rene' 41 (J 1610) BMS 7-95 material. Photographs of the panel are on Figures 9, 10 and 11, Volume I. 2.6.7 Test Specimen, Dwg. 25-20370-2 2.7 Panel 25-20370-2 was identical to panel 25-20370-1, except that the 2.7.1 panel was modified for two tests, LT-5593-2-6B and -4-4. Six hat-section stiffeners were riveted to the corrugation crests 2.7.1.1 to increase panel rigidity. A photograph of the modified panel is shown on Figure 12, Volume I. 2.7.1.2 Test Specimen, Dwg. 25-20352-1 (Reference, Figure 233). 2.8 The test panel was fabricated with a .008" skin into which five 2.8.1 creases. .20' deep, and on 6.00" centers, were formed. Overall finished dimensions were 36.00" x 23.35". Twenty-three corrugations, with a pitch of 1.50" and a .75" depth, 2.8.2 were formed from a sheet of .008" material and spotwelded to the creased skin. Six .020" support clips were spotwelded and riveted to each 36.00" 2.8.3 side. Two formed channels, .032" x 2.00" x .75", were bolted to the 2.8.4 support angles parallel to the 36.00 sides. Skin, corrugations, support angles and channels were made from 2.8.5 Rene' 41 (J 1610) BMS 7-95 material. Photographs of the panel are shown on Figures 13 and 14, Volume I. 2.8.6 Test Specimen, Dwg. 25-20352-2 2.9 Panel 25-20352-2 was identical to panel 25-20352-1 except the two 2.9.1 .032" x .75" x 2.00" channels were not included. Photographs of the panel are shown on Figures 15 and 16, Volume I.

2.9.2

- 2.10 INSTRUMENTATION
- 2.10.1 Test LT-5593-1 Sonic Test (Panels 25-20344 and 25-20369-1, -2)
- 2.10.1.1 Two Altec 21 BR-200 microphones were used to monitor the sound level
- 2.10.1.1.1 One microphone was placed inside the progressive wave chamber to monitor the sound level at the face of the specimen.
- 2.10.1.1.2 The second microphone was located on the opposite side of the specimen external to the progressive wave chamber.
- 2.10.1.2 Three non-contact deflection pickups were used to monitor the RMS deflections of the panel.
- 2.10.1.2.1 One deflection pickup was mounted along the centerline of the 23.5" edge at 1/4 point.
- 2.10.1.2.2 A second deflection pickup was along the centerline of the 17.5" edge at 1/4 point.
- 2.10.1.2.3 A third deflection pickup was mounted at the center of the panel.
- 2.10.1.3 Photographs showing microphone and deflection pickups are shown on figures 17 and 18, Volume I.
- 2.10.1.4 The test panels were instrumented with 6 chromel-alumel control thermocouples for the heating cycle phase of the test. See Figure 65, Volume I.
- 2.10.2 Test LT-5593-2 Thermal Cycle Tests
- 2.10.2.1 Test LT-5593-2-1 (Panel 25-20374-1)
- 2.10.2.1.1 Fifty-four chromel-alumel thermocouples were spotwelded to the panel and beaded seals. See Figures 66, 67 and 68, Volume I.
- 2.10.2.1.2 Electronic deflection indicators were attached at seven locations to measure vertical deflections. Locations are shown on Figure 69, Volume I.
- 2.10.2.1.3 Electronic deflection indicators were attached at three locations to measure horizontal deflections at the ends and midpoint of one 35.6 side.
- 2.10.2.2 Test LT-5593-2-2 (Panel 25-20374-2)
- 2.10.2.2.1 Eleven chromel-alumel thermocouples were spotwelded to the panel. Thermocouple locations are shown on Figure 70, Volume I.
- 2.10.2.2.2 Electronic deflection indicators were attached at five locations to measure vertical deflections. Locations are shown on Figure 71, Volume I.
- 2.10.2.3 Test LT-5593-2-3 (Panel 25-20352-1 and 25-20374-1)

- 2.10.2.3.1 Ten chromel-alumel thermocouples were spotwelded to the 25-20352-1 panel, as shown on Figure 72, Volume I.
- 2.10.2.3.2 Eight chromel-alumel control thermocouples were spotwelded to the 25-20374-1 panel as shown on Figure 73, Volume I.
- 2.10.2.3.3 Electronic deflection indicators were attached at five locations as shown on Figure 74, Volume I. Quartz rods were used to actuate the electronic deflection indicators DO2, DO4 and DO6.
- 2.10.2.4 Test LT-5593-2-4 (Panel 25-20352-2)
- 2.10.2.4.1 Instrumentation for this test was identical to that for LT-5593-2-3.
- 2.10.2.5 Test LT-5593-2-5 (Panel 25-20370-1)
- 2.10.2.5.1 Instrumentation for this test was identical to that for LT-5593-2-3.
- 2.10.2.6 Test LT-5593-2-6 (Panel 25-20370-2)
- 2.10.2.6.1 Instrumentation for this test was identical to that for LT-5593-2-3.
- 2.10.2.7 Test LT-5593-2-6B (Fanel 25-20370-2)
- 2.10.2.7.1 Ten chromel-alumel monitor thermocouples were spotwelded to the panel in the locations shown on Figure 75, Volume I.
- 2.10.2.7.2 Seven chromel-alumel control thermocouples were spotwelded to the panel in the locations shown on Figure 75, Volume I.
- 2.10.2.7.3 Five electronic deflection indicators were attached to the panels as shown on Figure 76, Volume I.
- 2.10.3 Test LT-5593-3 Shear Tests
- 2.10.3.1 Test LT-5593-3-1 (Panel 25-20374-1)
- 2.10.3.1.1 Eleven chromel-alumel monitor thermocouples were spotwelded to the panel in the locations shown on Figure 77, Volume I.
- 2.10.3.1.2 Nine chromel-alumel control thermocouples were spotwelded to the panel in the locations shown on Figure 78, Volume I.
- 2.10.3.1.3 Five electronic deflection indicators were attached to the panel at the locations shown on Figure 78, Volume I to measure vertical deflections.
- 2.10.3.2 Test LT-5593-3-2 (Panel 25-20352-2)
- 2.10.3.2.1 Thermocouple installations and locations were identical to those of Test LT-5593-3-1.
- 2.10.3.2.2 Eight electronic deflection indicators were attached at the four panel corners as shown on Figure 79, Volume I.

- 2.10.3.3 Test LT-5593-3-3 (Panel 25-20370-1)
- 2.10.3.3.1 Thermocouple installations and locations were identical to those of Test LT-5593-3-1.
- 2.10.3.3.2 Eight electronic deflection indicators were attached to the panel at three corners as shown on Figure 80, Volume I.
- 2.10.4 Test LT-5593-4 Pressure Tests
- 2.10.4.1 Test LT-5593-4-1 (Panel 25-20374-1)
- 2.10.4.1.1 Thermocouple installations and locations were identical to those of Test LT-5593-3-1.
- 2.10.4.1.2 Five electronic deflection indicators were attached to the panel at the locations shown on Figure 78, Volume I.
- 2.10.4.2 Test LT-5593-4-2 (Panel 25-203/4-2)
- 2.10.4.2.1 Eleven chromel-alumel monitor thermocouples were spotwelded to the panel in the locations shown on Figure 77, Volume I.
- 2.10.4.2.2 Nine chromel-alumel control thermocouples were spotwelded to the panel as shown on Figure 78, Volume I.
- 2.10.4.2.3 Five electronic deflection indicators were attached to the panel at the locations shown on Figure 78, Volume I.
- 2.10.4.3 Test LT-5593-4-3 (Panel 25-20352-1)
- 2.10.4.3.1 Thermocouple installations and locations, and electronic deflection indicator attachment locations are identical to those of LT-5593-4-2,
- 2.10.4.4 Test LT-5593-4-4 (Panel 25-20370-2)
- 2.10.4.4.1 Thermocouple installations and locations, and electronic deflection indicator attachment locations are identical to those of LT-5593-4-2.
- 2.10.4.5 Test LT-5593-4-5 (Panel 25-20352-2)
- 2.10.4.5.1 Electronic deflection indicator number and location was identical to that of LT-5593-4-2.
- 2.10.4.5.2 No thermocouples were used as this test was at room temperature.
- 2.10.4.6 Test LT-5593-4-6 (Panel 25-20370-1)
- 2.10.4.6.1 Electronic deflection indicator number and location was identical to that of LT-5593-4-2.
- 2.10.4.6.2 No thermocouples were used as this test was at room temperature.

- 2.10.5 Test LT-5593-5 Sonic Test (Panel 25-20344)
- 2.10.5.1 Four Altec 21BR-200 microphones were used to monitor sound level.
- 2.10.5.1.1 The microphones were located as follows:

Microphone	Location
1	Center of 24" edge nearest horn with panel in 0° position.
2	Center of panel - outside face.
3	Center of 24" edge farthest from horn with panel in 0° position.
14	Center of panel - inside anechoic box.

2.10.5.2 Three non-contact deflection pickups were used to monitor the RMS deflections of the panel in an identical manner to that used in LT-5593-1.

3.0 TEST SETUP 3.1 Test Setup for LT-5593-1 3.1.1 Sonic test panels 1477, 1478, 1479 (Panels 25-20344) were mounted through the end clips to a pair of .040 gage Rene' 41 channels with 3/16" dia. bolts. The Reme' di channels in turn were attached at each end by 1/2" dia. bolts t the steel frame around the 24" opening in the progressive wave cest chamber. The 23.5" edge of the specimens was unsupported. Two Altec-Lansing Model 6786 electro-pneumatic transducers mounted 3.1.2 at the throat of the progressive wave chamber served as the sound source. The electrical signal to the transducers was provided by an Allison 3MAN9 noise generator and octave band equalizer through a dual channel McIntosh amplifier. Refer to Figure 19, Volume I, for a photograph of the sonic test setup. 3.1.3 Sonic test panels No. 1493, 1494, and 1495 (panels 25-20369-1) were mounted through the end clips to a pair of .040 gage Rene' 41 channels with 3/16" dia. bolts. The Rene' 41 channels were attached at each end by a 1/2" dia. bolt to the steel frame of the 24" opening in the progressive wave chamber. The 23.35" edge was unsupported. Sonic test panels No. 1497, 1498, and 1499 (panels 25-20369-2) 3.1.4 were mounted at one end by bolting a .040 Rene' channel with six 3/16' bolts to the three tabs provided. Each end of the channel was then bolted to the frame of the test chamber with two 1/2" bolts. The opposite end of the panel (17.0" edge) was secured to the test frame by flexible plates in horizontal and vertical positions. The edge of the foil seal was clamped between the test frame and a $1/4 \times 1/4$ bar with five 5/32" bolts. See Figure 20, Volume I, for mounting details. 3.1.5 Four Altec-Lansing Model 6786 electro-pneumatic transducers mounted at the throat of the progressive wave chamber served as the sound source. The electrical signal to the transducers was provided by an Allison 3MAN9 noise generator and octave band equalizer through a dual channel McIntosh amplifier. 3.2 Test Setup for LT-5593-2 3.2.1 Test Setup for LT-5593-2-1 (Panel 25-20374-1) 3.2.1.1 The test panel was mounted on a vacuum box lined from top to bottom with 2.5" thick K-30 insulation brick. A sketch of the box is shown on Figure 82, Volume I. A photograph of the panel installation is on Figure 21, Volume I. Two 25-20344 panels were placed 10.6" below the test panel in the 3.2.1.2 vacuum box to simulate a proposed upper wing panel. 3.2.1.3 Thirty-seven high density radiant heat lamps were mounted above the test panel and were controlled from eight zones, shown on Figure 78,

Volume I. The lamp locations are shown on Figure 81, Volume I.

3.2.1.4	A beaded seal was spotwelded to the box as shown on Figure 22, Volume I.
3.2.1.5	An overall view of the specimen test setup is shown on Figure 23, Volume I.
3.2.2	Test Setup for LT-5593-2-2 (Panel 25-20374-2)
3.2.2.1	This test setup was identical to the one used for LT-5593-2-1, except a 2.0" thick layer of Fibre Frax batt was placed approximate two inches below the support channels of the test panel.
3.2.3	Test Setup for LT-5593-2-3 (Panel 25-20352-1)
3.2.3.1	The test panel was mounted below a re-radiating panel as shown on Figures 82 and 24, Volume I.
3.2,3.2	The heat lamp setup and arrangement was identical to that of LT-5593-2-1.
3.2.4	Test Setup for LT-5593-2-4 (Panel 25-20352-2)
3.2.4.1	Test panel mounting and heat lamp setups were identical to those of LT-5593-2-3.
3.2.5	Test Setup for LT-5593-2-5 (Panel 25-20370-1)
3.2.5.1	Test panel mounting and heat lamp setups were identical to those of LT-5593-2-3.
3.2.6	Test Setup for LT-5593-2-6 (Panel 25-20370-2)
3.2.6.1	Test panel mounting and heat lamp setups were identical to those of LT-5593-2-3.
3.2.7	Test Setup for LT-5593-2-6B (Panel 25-20370-2)
3.2.7.1	The test panel was mounted in the vacuum box as shown on Figure 83, Volume I.
3.2.7.2	The heat lamp setup and arrangement was identical to that of LT-5593-2-1.
3.3	Test Setup for LT-5593-3
3.3.1	Test Setup for LT-5593-3-1 (Panel 25-20374-1)
3.3.1.1	An H52-1B hydraulic ram was attached to one corner of the test panel in order to apply a load parallel to the long dimension of the panel.
3.3.1.2	The panel was mounted in the vacuum box by rigidly fastening the corner opposite the loading point to the vacuum box, using a welded up fixture of .37" Incomel X plates.

The loaded corner was restricted to motion in the direction of 3.3.1.3 loading by attaching it to the box with a .050" Rene' 41 'Z' shaped fitting. The general arrangement of the panel mounting is shown on Figure 84, 3.3.1.4 Volume I. The hydraulic ram setup and the vacuum box were rigidly mounted 3.3.1.5 to the tie down rails in the floor of the test area. 3.3.1.6 The heat lamp setup and arrangement was identical to that of LT-5593-2-1. A photograph of the setup is shown on Figure 25, Volume I. 3.3.1.7 Test Setup for IM-5593-3-2 (Penel 25-20352-2) 3.3.2 The entire test setup was identical to that for LT-5593-3-1. 3.3.2.1 Test Setup for LT-5593-3-3 (Panel 25-20370-1) 3.3.3 The entire test setup was identical to that for LT-5593-3-1. 3.3.3.1 3.4 Test Setup for LT-5593-4 Test Setup for LT-5593-4-1 (Panel 25-20374-1) 3.4.1 The test setup was identical to that of LT-5593-2-1, except that 3.4.1.1 a model 600 Jaeger compressor was used as a vacuum pump to apply uniform loading to the test panel surface by creating a pressure differential across the top and bottom panel surfaces. Test Setup for LT-5593-4-2 (Panel 25-20374-4) 3.4.2 The test panel was mounted in the vacuum box as shown on Figure 85, 3.4.2.1 Volume I. Incomel 702 foil seals were spotwelded to the panel and to the 3.4.2.2 vacuum box to provide a seal for the pressure tests, but were omitted in the unsymmetrical heat cycles. A two-inch thick Fibre Frax blanket was placed below the panel 3.4.2.3 in all tests to block the flow of heat to the bottom of the vacuum box. 3.4.2.4 The pressure loading setup was identical to that of LT-5593-4-1. The heat lamp setup and arrangement was identical to that of 3.4.2.5 LT-5593-2-1. Test Setup for LT-5593-4-3 (Panel 25-20352-1) 3.4.3 The test setup was identical to that for LT-5593-4-2. 3.4.3.1

- 3.4.4 Test Setup for LT-5593-4-4 (Panel 25-20370-2)
- 3.4.4.1 The test setup was identical to that for LT-5593-4-2.
- 3.4.5 Test Setup for LT-5593-4-5 (Panel 25-20352-2)
- 3.4.5.1 The test setup was identical to that for LT-5593-4-2 except no heat lamps or fibrefrax insulation was used since the test was to be run at room temperature.
- 3.4.6 Test Setup for LT-5593-4-6 (Fanel 25-20370-1)
- 3.4.6.1 The test setup was identical to that for LT-5593-4-5.
- 3.5 Test Setup for LT-5593-5
- Panel 25-20344-1, sonic test panel No. 1477, was mounted through the end clips to a pair of .040 gage Rene' 41 channels with 3/16" dia. bolts. The Rene' 41 channels in turn were attached at each end by 1/2" dia. bolts to a steel "picture frame" jig. The 23.5" edge of the specimen was unsupported. An anechoic box was attached to the underside of the "picture frame" jig to attenuate the sound level at the inside surface of the specimen. The panel mounting fixture was built so that the angle of sound with respect to the panel could be continuously varied at any angle from 0 to 90°. The exponential steel horn was rolled up to the panel mounting fixture with the axis of the horn bisecting the 23.5" panel edge.
- 3.5.2 Two Altec-Lansing Model 6786 electropneumatic transducers mounted on the exponential horn served as the noise source. The electrical signal to the transducers was provided by an Allison 3MAN9 noise generator and octave band equalizer through a dual channel McIntosh amplifier.
- 3.5.3 The microphones were monitored with a Ballantine true rms meter and a General Radio octave band analyzer. The outputs of the displacement pickups were also measured with the Ballantine meter. The output of both the microphones and the displacement pickups was tape recorded on a 4 sec. continuous loop tape for each condition.

- 4.0 TEST PROCEDURE
- 4.1 Test procedure for LT-5593-1 (Panels 25-20344-1, No's. 1477, 1478, 1479)
- Each of three panels was sonic tested for five minutes at an overall sound level of 152 db. The output of the microphones was analyzed on a General Radio octave band analyzer and also recorded on magnetic tape. The microphone output octave band analysis was compared to the theoretical design spectrum. The output of the non-contact amplitude pickups were also recorded on magnetic tape.
- 4.1.2 After completing five minutes of sonic testing, the panels were inspected for failures and then sent to the Structures Laboratories Heat Lab. for a 15 minute 2000°F heat cycle test. (Ref. Pigure 143).
- The panels were returned to the Sonic Laboratory, inspected for failures and photographed. Each panel was reinstalled in the progressive wave chamber and sonic tested to the same spectrum for an additional 55 minutes. Microphone output was analyzed on the General Radio octave band analyzer and tape recordings made of the microphones and deflection pickups at the beginning and end of the 55 minute period. Each panel was removed from the progressive wave chamber and visually inspected for additional failures at 15 to 20 minute intervals and at the end of the test.
- 4.2 Test procedure for LT-5593-1 (Panels 25-20369-1, No's. 1493, 1494, 1495 and 25-20369-2, No's. 1497, 1498, 1499)
- Each of six panels was sonic tested for five minutes at an overall sound level of 152.5 db. The output of the microphones was analyzed on an octave band analyser and compared to the theoretical design spectrum. The output of the microphones was also recorded on magnetic tape. Spectral density analyses were made from these tapes.
- 4.2.2 After completing five minutes of sonic testing, the panels were inspected for failures and sent to the Structures Laboratories Heat Lab. for the heat environment cycle defined in Paragraph 4.1.2.
- The panels were then returned to the Sonic Laboratory, inspected for failures, and photographed. Each panel was reinstalled in the progressive wave chamber and sonic tested to the same spectrum for an additional 55 minutes. Microphone output was analyzed on the octave band analyzer and tape recordings made of the microphones and deflection pickups at the beginning and end of the 55 minute period. The test plan was changed during this phase of the program to include a 30 second test at an increased sound level of 157.5 db and another 30 second test at an increased level of 162.5 db. Data were recorded during each new level. Panels 1497, 1498, and 1499 were subjected to the revised sonic levels. Each panel was removed from the progressive wave chamber and visually inspected for failures at 15 to 20 minute intervals and at the end of the test.

4.3	Test	procedure	for	LT-5593-2		
4.3.1	Test	procedure	for	LT-5593-2-1	(Panel 25-203	374-1)

- 4.3.1.1 The simulated and test panels were subjected to a heating program consisting of ten cycles of symmetrical heat application to a maximum of 1750°F, plus an unsymmetrical heating cycle, also to 1750°F, as shown on Figure 89, Volume I. A linear temperature gradient was maintained from one long edge to the other.
- 4.3.1.2 Vertical and horizontal deflections were recorded during the heat cycling.
- 4.3.1.3 The digital data system was employed to record and reduce the data.
- 4.3.2 Test procedure for LT-5593-2-2 (Panel 25-20374-2)
- 4.3.2.1 The test panel was subjected to a heating program consisting of ten cycles of symmetrical heat application to 1370°F maximum plus an unsymmetrical heating cycle, also to 1870°F, as shown on Figure 90, Volume I. A linear temperature gradient was maintained from one long edge to the other.
- 4.3.2.2 The eleven monitor thermocouples were recorded at 24-second intervals utilizing a Leeds and Northrup strip chart recorder and a Boeing-designed stepping switch. The outputs from the five electronic deflection indicators were recorded during the first and last 25 minutes of testing on Electro Instruments' X-Y plotters.
- 4.3.3 Test procedure for LT-5593-2-3 (Panel 25-20352-1)
- 4.3.3.1 The 25-20374 panel, mounted in the outer, or upper, position on the vacuum box, was heated from above and re-radiated its heat to the test panel in the inner, or lower, position in the box.
- 4.3.3.2 The test panel heat program is shown on Figure 91, Volume I.
- Thermocouple 4A, on the crest of an inner panel corrugation (see Figure 72, Volume I), was used to follow temperature on a manually controlled preliminary survey. Control thermocouple data from this survey was used to establish the program curves for the actual test.
- 4.3.3.4 Vertical panel deflections were recorded during the test.
- 4.3.4 Test procedure for LT-5593-2-4 (Panel 25-20352-2)
- 4.3.4.1 Test LT-5593-2-4 was run in a manner identical to that of test LT-5593-2-3.
- 4.3.5 Test procedure for LT-5593-2-5 (Panel 25-20370-1)
- 4.3.5.1 Test LT-5593-2-5 was run in a manner identical to that of test LT-5593-2-3.

Test procedure for LT-5593-2-6 (Panel 25-20370-2) 4.3.6 Test IN-5593-2-6 was run in a manner identical to that of LT-5593-2-3 4.3.6.1 4.3.7 Test procedure for LT-5593-2-6B (Panel 25-20370-2) Panel 25-20370-2 was subjected to an unsymmetrical heat condition 4.3.7.1 consisting of a 250°F thermal gradient from one long edge of the panel to the other. Maximum temperature was 1200°F. See Figure 92, Volume I. 4.3.7.2 The panel was heated at a rate of 15°F/sec along one edge and at 13°F/sec along the opposite edge. 4.3.7.3 Vertical deflections were measured during the heat condition. 4.3.7.4 Two heat cycles were run. 4.4 Test procedure for LT-5593-3 4.4.1 Test procedure for LT-5593-3-1 (Panel 25-20374-1) 4.4.1.1 The test panel was heated symmetrically to 1870°F at a rate of 5°F/sec. 4.4.1.2 After the panel had reached test temperature, a shear load was applied at a rate of 100 lb/min. until failure of the panel occurred. 4.4.1.3 Electronic deflection indicator readings were recorded during the test. 4.4.2 Test procedure for LT-5593-3-2 (Panel 25-20352-2) 4.4.2.1 Test procedure for LT-5593-3-2 was identical to that of LT-5593-3-1 except the panel was not loaded to failure. 4.4.2.1.1 Loading was discontinued when deflection of the panel at the loading point had reached approximately .40". 4.4.3 Test procedure for LT-5593-3-3 (Panel 25-20370-1) 4.4.3.1 Test procedure for LT-5593-3-3 was identical tothat of LT-5593-3-2. 4.5 Test procedure for LT-5593-4 4.5.1 Test procedure for LT-5593-4-1 (Panel 25-20374-1) The heating rate was to have been 3 degrees/second until the test 4.5.1.1 temperature of 1750°F was reached. The panel temperatures were then to have been allowed to stabilize after which a load rate of 1 PSI/ minute was to have been applied to the panel until failure occurred. (See paragraph 6.4.1 for actual test conduct.) 4.5.1.2 To prevent the seals from buckling and overheating as they neared the lamps, a uniform load of approximately 0.50 PSI was applied to the test panel before and during the heating period.

An Electro Instruments X-Y plotter was used to continuously record the pressure differential. The pressure transducer was located near 4.5.1.3 the bottom center of the vacuum box (reference Figure 71, Volume I). Eleven monitor thermocouples were recorded at 24 second intervals utilizing a Leeds & Northrup strip chart recorder and a Boeing designed stepping switch. Five electrical deflection indicators were also recorded continuously on Electro Instruments X-Y plotters. Test procedure for IN-5593-4-2 (Panel 25-20374-2) 4.5.2 The test panel was symmetrically heated to 1870°F at a rate of 5°F/sec. 4.5.2.1 A pressure of .50 PSI was applied before and during heating period to avoid buckling and overheating the seals during heating. 4.5.2.2 After heating stabilization, test pressure was applied at the rate 4.5.2.3 of 1.0 PSI/min. until failure. Load was measured by a pressure transducer and automatically recorded 4.5.2.4 on an X-Y plotter. Vertical deflections were measured during the test. 4.5.2.5 Test procedure for LT-5593-4-3 (Panel 25-20352-1) 4.5.3 The test panel was given an unsymmetrical heat cycle by heating to 2000°F along one long edge at a rate of 15°F/sec, and herting to 4.5.3.1 1750°F along the opposite edge at a rate of 13°F/sec. Deflection readings were taken during the heating cycle. 4.5.3.2 The test panel was then cooled to room temperature. 4.5.3.3 The test panel was then given a symmetrical heat cycle to 1870°F 4.5.3.4 at a rate of 5°F/sec. After the panel had reached test temperature, test pressure was applied at a rate of 1.0 PSI/min. until panel failure. 4.5.3.5 Deflection readings were taken during loading. 4.5.3.6 Load was measured by a pressure transducer and automatically recorded 4.5.3.7 on an X-Y plotter. Test procedure for LT-5593-4-4 (Panel 25-20370-2) 4.5.4 The test procedure for INT-5593-4-4 was identical to that of INT-5593-4-3. 4.5.4.1 Test procedure for LT-5593-4-5 (Panel 25-20352-2) 4.5.5 Test pressure was applied at a rate of 1.0 PSI/min. until panel failure. 4.5.5.1 Load was measured by a pressure transducer and automatically recorded 4.5.5.2 on an X-Y plotter.

- 4.5.5.3 Vertical deflections were measured during the test.
- 4.5.6 Test procedure for LT-5593-4-6 (Panel 25-20370-1)
- 4.5.6.1 The test procedure for LT-5593-4-6 was identical to that of LT-5593-4-5.
- 4.6 Test procedure for LT-5593-5 (Panel 25-20344-1, No. 1477)
- 4.6.1 The panel response was measured at two overall sound levels, 140 db and 147 db. The spectrum was shaped to the design octave band spectrum using the Allison equalizer with the panel at 0° sound incidence. Tape recordings of the microphone and pickup output were made at each specified angle of sound incidence. A power spectral density analysis was run on each recording and a peak count analysis was made of five selected recordings.
- 4.7 Panel Testing Summary

Panel Drawing Number	Panel Number	Testing Sequence
25-20344-1	1477 1478 1479	LT-5593-5, -1 LT-5593-1 LT-5593-1
25-20369-1	1493 1494 1495	LT-5593-1 LT-5593-1 LT-5593-1
25 - 20 369-2	1497 1498 1499	LT-5593-1 LT-5593-1 LT-5593-1
25-20352-1	One Panel Tested	LT-5593-2-3, -4-3
25 - 20 35 2 - 2	One Panel Tested	LT-5593-2-4, -3-2, -4-5
25-20370-1	One Panel Tested	LT-5593-2-5, -3-3, -4-6
25-20370-2	One Panel Tested	LT-5593-2-6, -2-6B,
25-20374-1	One Panel Tested	LT-5593-2-1, 4-1, 3-1
25-20374-2	One Panel Tested	IT-5593-2-2, -4-2



Panel was subsequently subjected to vibration and acceleration tests as detailed in D2-80080, "Insulated Panel Development Dyna-Soar".

5.0	TEST RESULTS
5.1	Test results, LT-5593-1
5.1.1	Panels 25-20344, No's. 1477, 1478, 1479
5.1.1.1	The individual panel test logs with inspection records are shown on Figures 93 through 95, Volume I.
5.1.1.2	45 power spectral density analyses were made from the magnetic tape records. See Figures 96 through 140, Volume I.
5.1.1.3	Time-temperature graphs of the heat cycle on each panel are plotted on Figures 141 through 143, Volume I.
5.1.1.4	Microphone output compared to design spectrum is shown on Figures 144 through 146, Volume I.
5.1.2	Panels 25-20369-1, No's. 1493, 1494, 1495 and 25-20369-2, No's 1497, 1498, 1499
5.1.2.1	The individual panel test logs with inspection records are shown on Figures 147 through 152, Volume I.
5.1.2.2	TPC power spectral density analyses of sound and panel amplitude plots and peak counts were made from the tape recordings. See Figures 153 through 222, Volume I.
5.1.2.3	Microphone output compared to design spectrum is shown on Figures 223 through 228, Volume I.
5.2	Test results, LT-5593-2
5.2.1	Test results, LT-5593-2-1 (Panel 25-20374-1)
5.2.1.1	Seven vertical deflections were recorded to determine the vertical deflections of the 25-20374 panel center and the centers of the long edges with respect to the panel corners. The maximum vertical deflection occurred during the early cycles at the panel center and was approximately 0.40 inches. See Figures 1 through 46, Volume II.
5.2.1.2	Horizontal deflections of the long edge (heated to 1500°F maximum) mid point and ends were measured. No significant deviation among the three measurements was observed. Maximum horizontal deflections reached 0.11 inches during the first ten cycles and 0.09 inch during the unsymmetrical heating cycle. See Figures 7 and 8, Volume II.
5.2.1.3	Temperature data is included on Figures 9 through 40, Volume II.
5.2.2	Test results, LT-5593-2-2 (Panel 25-20374-2)
5.2.2.1	Thermocouple data is included on Figures 41 through 66, Volume II.

- 5:2.2.2 Deflection curves are included on Figures 67 through 71, Volume II.
- 5.2.3 Test results, LT-5593-2-3 (Panel 25-20352-1)
- 5.2.3.1 Deflection of the inner, or test, panel was measured at three points.
- 5.2.3.1.1 Deflections at two corners were measured to provide references for panel center deflections. Maximum deflection occurred at the panel center (EDI DO4) and was 0.24".
- 5.2.3.1.2 Deflection vs. time records are included on Figures 72 through 76, Volume II.
- 5.2.3.2 Temperature vs. time records are included on Figures 77 through 104, Volume II.
- 5.2.4 Test results, LT-5593-2-4 (Panel 25-20352-2)
- 5.2.4.1 Deflection of the inner, or test, panel was measured at three points.
- 5.2.4.1.1 Deflections at two corners were measured to provide references for panel center deflections. Maximum deflection occurred at the panel center (EDI DO4) and was 0.21".
- 5.2.4.1.2 Deflection vs. time records are included on Figures 105 through 109, Volume II.
- 5.2.4.2 Temperature vs. time records are included on Figures 110 through 137, Volume II.
- 5.2.5 Test results, LT-5593-2-5 (Panel 25-20370-1)
- 5.2.5.1 Deflection of the inner, or test, panel was measured at three points.
- 5.2.5.1.1 Deflections at two corners were measured to provide references for panel center deflections. Maximum deflection occurred at the panel center (EDI DO4) and was 0.38".
- 5.2.5.1.2 Deflection vs. time records are included on Figures 138 through 142, Volume II.
- 5.2.5.2 Temperature vs. time records are included on Figures 143 through 168, Volume II.
- 5.2.6 Test results, LT-5593-2-6 (Panel 25-20370-2)
- 5.2.6.1 Deflections of the inner, or test, panel were measured at three points.
- 5.2.6.1.1 Deflections at two corners were measured to provide references for panel center deflections. Maximum deflection occurred at the panel center (EDI DO4) and was 0.45".
- 5.2.6.1.2 Deflection vs. time records are included on Figures 169 through 173, Volume II.

Temperature vs. time records are included on Figures 174 through 5.2.6.2 197, Volume II. Test results, LT-5593-2-6B (Panel 25-20370-2) 5.2.7 A record of peak test temperatures is given on Figure 75, Volume I, 5.2.7.1 for both cycles. Maximum deflection of the panel occurred at the center of the 5.2.7.2 panel 3.75 minutes after the start of each cycle and was .465" in cycle one, and .490" in cycle two. Deflections at all EDI locations at 3.75 minutes are given for both 5.2.7.3 cycles on Figure 76, Volume I. Deflection vs. time records are included on Figures 198 through 5.2.7.4 202, Volume II. 5.3 Test results, LT-5593-3 Test results, LT-5593-3-1 5.3.1 No data was taken on this test. 5.3.1.1 Test results, LT-5593-3-2 (Panel 25-20352-2) 5.3.2 Deflection vs. load curves are included on Figures 203 through 5.3.2.1 210, Volume II. Test results, LT-5593-3-3 (Panel 25-20370-1) 5.3.3 Deflection vs. load curves are included on Figures 211 through 5.3.3.1 218, Volume II. Test results, LT-5593-4 5.4 Test results, LT-5593-4-1 (Panel 25-20374-1) 5.4.1 The pressure applied to the panel remained nearly constant during 5.4.1.1 the tests (reference Figure 219, Volume II). Deflection curves are shown on Figures 220 through 224, Volume II. The maximum recorded deflection was 1.02 inches measured near the panel center. Monitor thermocouple temperatures during power and panel failures are represented on Figure 225, Volume II. Time vs. temperature curves are included on Figures 226 through 5.4.1.2 233, Volume II. Test results, LT-5593-4-2 (Panel 25-20374-2) 5.4.2 The test panel failed at a load of 1.1 PSI. 5.4.2.1 Panel center deflection immediately preceding failure was .38" measured 5.4.2.2 from the panel position at temperature without load.

Deflection vs. pressure data are included on Figures 234 through 5.4.2.3 238, Volume II. Test results, LT-5593-4-3 (Panel 25-20352-1) 5.4.3 Maximum deflection during the unsymmetrical heat cycle was .33" 5.4.3.1 at the center of the panel at maximum temperature. During the pressure phase, the panel failed at a load of 2.05 PSI. 5.4.3.2 The deflection of the panel center, immediately prior to failure, 5.4.3.3 was .78" measured from panel position at temperature without load. Deflection vs. pressure data are included on Figures 239 through 5.4.3.4 243, Volume II. Test results, LT-5593-4-4 (Panel 25-20370-1) 5.4.4 The maximum deflection during the unsymmetrical heating cycle at 5.4.4.1 the panel center was approximately .8". The pressure test caused panel failure by buckling at 2.05 PSI. 5.4.4.2 Maximum center deflection, at instant of failure, was approximately 5.4.4.3 1.0". Deflection vs. pressure data are included on Figures 244 through 5.4.4.4 248, Volume II. Test results, LT 5593-4-5 (Panel 25-20352-2) 5.4.5 Deflection vs. pressure curves are included on Figures 249 5.4.5.1 through 253, Volume II. Test results, LT-5593-4-6 (Panel 25-20370-1) 5.4.6 Deflection vs. pressure curves are included on Figures 254 5.4.6.1 through 258, Volume II. Test results, LT-5593-5 (Panel 25-20344-1, No. 1477) 5.5 The effect of sound angle of incidence on panel amplitude at 140 db 5.5.1 and 147 db is shown on Figure 259, Volume II. In addition, 49 power spectral density analyses were made. See Figures 260 through 308, Volume II. Microphone output compared to design spectrum is shown on 5.5.2 Figures 309 and 310, Volume II.

The following is a tabulation of types of tests run and panels 5.6 tested.

LT-5593-1	Sonic Tests	Panel 25-20344
	Sonic Tests	Panel 25-20369-1, -2
LT-5593-2-1	Thermal Cycle Tests	Panel 25-20374-1
LT-5593-2-2	Thermal Cycle Tests	Panel 25-20374-2
LT-5593-2-3	Thermal Cycle Tests	Panel 25-20352-1
LT-5593-2-4	Thermal Cycle Tests	Panel 25-20352-2
LT-5593-2-5	Thermal Cycle Tests	Panel 25-20370-1
LT-5593-2-6	Thermal. Cycle Tests	Panel 25-20370-2
LT-5593-2-6B	Thermal Cycle Tests	Panel 25-20370-2
LT-5593-3-1	Shear Tests	Panel 25-20374-1
LT-5593-3-2	Shear Tests	Panel 25-20352-2
LT-5593-3-3	Shear Tests	Panel 25-20370-1
IN-5593-4-1	Pressure Tests	Panel 25-20374-1
LT-5593-4-2	Pressure Tests	Panel 25-20374-2
LT-5593-4-3	Pressure Tests	Panel 25-20352-1
LT-5593-4-4	Pressure Tests	Panel 25-20370-2
LT-5593-4-5	Pressure Tests	Panel 25-20352-2
LT-5593-4-6	Pressure Tests	Panel 25-20370-1
LT-5593-5	Sonic Tests	Panel 25-20344



Two 25-20369-1 panels were subsequently subjected to vibration and acceleration tests as detailed in D2-80080, "Insulated Panel Development Dyna-Soar".

- 6.0 TEST OBSERVATIONS
- 6.1 Test observations, LT-5593-1
- 6.1.1 Panels 25-20344, No's. 1477, 1478, 1479
- 6.1.1.1 No failures were detected at the end of the first five minutes of sonic testing. At the end of the 15 minute heat test, the panel skins had assumed a general waffle-like appearance and numerous spotweld failures and skin cracks occurred along the supported edges of the specimen. At each inspection interval during the 55 minute sonic test, additional spotweld failures and skin cracks were detected.
- 6.1.1.2 Diagrams indicating spotweld failures and skin cracks due to heat and sonic testing are presented on Figures 86, 87 and 88, Volume I.
- 6.1.1.3 Photographs of the specimens after the 5 minute sonic test and 2000°F. heat test, but prior to the 55 minute sonic test, are shown on Figures 26, 27 and 28, Volume I, with the failures marked with an inking pen.

Photographs of the specimen after the 55 minute sonic test are on Figures 29, 30 and 31, Volume I.

- 6.1.1.4 The reasons that the heat cycles differed for each panel were as follows:
- 6.1.1.4.1 Panel 1477 During the increase from 1300°F. to 2000°F., a bad
 Thyratron in Phase II of the power unit for Zone 2 caused Zone 2
 to have a slower heat rate than Zone 1.
- 6.1.1.4.2 Panel 1478 After the temperature had been at 2000°F. for 25 seconds, a malfunction of equipment cutoff power to the heat lamps. The temperature decreased to ambient and Dyna-Soar personnel inspected the panel. The panel was then heated to 2000°F. and held there for 15 minutes.
- 6.1.1.4.3 Panel 1479 All test conditions were completed according to the predetermined time-temperature program.
- 6.1.2 Panels 25-20369-1, No's. 1493, 1494, 1495 and 25-20369-2, No's. 1497, 1498, 1499
- 6.1.2.1 No failures were detected at the end of the first 5 minutes of sonic testing. Sonic testing of the panels after the heat test produced no detectable structural failures on visual inspection in the Sonic Leb. Small fragments of the Fiberfrax insulation crumbled and vibrated from between the skin structure and wire mesh backing along the exposed edges of panels.
- 6.1.2.2 Photographs of the specimens after the 5 minute sonic test and the 2000°F. heat test, but prior to the 55 minute sonic test, are shown on Figures 32 through 43, Volume I.

- 6.1.2.3 Panel 1494 was burned so badly during the heat test that further sonic testing was not completed on this panel.
- 6.2 Test observations, LT-5593-2
- 6.2.1 Test observations, LT-5593-2-1, Panel 25-20374-1
- 6.2.1.1 Thermocouples on the beaded seal indicated temperatures in excess of 2000°F during the first cycle and necessitated the disconnection of seven lamps in this area for the remainder of the test. The beaded seal temperatures were then observed to have a maximum gradient of approximately 700°F and did not exceed 1700°F. One corner of the 25-20374 panel was consistently 200°F below the rest of the panel at maximum temperature.
- 6.2.1.2 Thermocouples show that a non-linear lateral temperature distribution during the unsymmetrical heating cycle subjected the 25-20374 panel to more thermal stress than if the required linear distribution could have been produced.
- 6.2.1.3 Surface panel damage if any, could not be detected. Only broken spotwelds between the panel seal and the beaded seal were evident.
- 6.2.2 Test observations, LT-5593-2-2 (Panel 25-20374-2)
- 6.2.2.1 Thermocouple data indicate that maximum panel surface temperature deviations from the required temperatures occurred during the 11th or unsymmetrical heating cycle.
- 6.2.2.1.1 Thermocouple No. 7 reached a maximum of 1630°F during this cycle versus the 1870°F stipulated. Simularly, during the 11th cycle, thermocouples no. 4 required a 1685°F maximum and no. 40 required a 1500°F maximum. They reached maximums of 1720°F and 1545°F respectively. A panel surface temperature (thermocouple no. 7) of 1660°F maximum was indicated as the largest deviation from the required temperature of 1870°F from the symmetrical heating cycles reported.
- 6.2.2.2 The surface of the Fiberfrax batt nearest the test panel reached a maximum of 1455°F forty-nine minutes after the start of the test.

 The gradient through the two inch thick insulation at this time was 520°F.
- 6.2.2.3 Temperature readings for the lower crest of the corrugation at the panel center (reference corrugation at the panel center, Figure 41, Volume II, thermocouple no. 3) are not reported due to a faulty thermocouple.

- Deflection curves indicate that a maximum vertical deflection of 6.2.2.4 0.37 inches occurred during the first heating cycle near the center of the panel. See Figure 70, Volume II.
- Buckling of the seals caused spotweld failures and some damage to 6.2.2.5 the panel seal. One-half inch diameter Inconel 702 foil disks, spotwelded to the panel seal in an attempt to repair holes or damage incurred during fabrication, loosened considerably.
- Test observations, LT-5593-2-3 (Panel 25-20352-1) 6.2.3
- Due to limitations of the X-Y plotters it was necessary to block 6.2.3.1 out the time base on the deflection record during some of the cycles on each test. The deflection curve for each of these cycles is represented by a straight vertical line from which only maximum and minimum deflections can be read.
- Examination of the deflection curves and the tested panel revealed 6.2.3.2 that no damage resulted from the tests.
- Test observations, LT-5593-2-4 (Panel 25-20352-2) 6.2.4
- Examination of the deflection curves and the tested panel revealed 6.2.4.1 that no damage resulted from the tests.
- Test observations, LT-5593-2-5 (Panel 25-20370-1) 6.2.5
- Due to limitations of the X-Y plotters, it was necessary to block 6.2.5.1 out the time base on the deflection record during some of the cycles on each test. The deflection curve for each of these cycles is represented by a vertical line from which only maximum and minimum deflections can be read.
- Deflection of one panel corner was indicated by the plotter as 6.2.5.2 being approximately 0.25" on cycles 5 and 6. (See curve for EDI DO1). Since this corner is limited in vertical motion by brackets attached to the vacuum box, (see plan view, Figure 82, Volume I), this data is questionable. Examination of the bracket installation after test showed no failure of this attachment that could have allowed this much deflection. Also an operational check of the recording equipment indicated normal performance.
- Test observations, LT-5593-2-6 (Panel 25-20370-2) 6.2.6
- Examination of the deflection curves and the tested panel revealed 6.2.6.1 that no damage resulted from the tests.
- Test observations, LT-5593-2-6B (Panel 25-20370-2) 6.2.7
- A visual examination of the panel following the test did not reveal 6.2.7.1 any damage.

- 6.3 Test observations, LT-5593-3
- 6.3.1 Test observations, LT-5593-3-1 (Panel 25-20374-1)
- 6.3.1.1 Panel deflections went beyond calibration range of the EDI's.
- 6.3.1.1.1 Calibrated range of the EDI's was .25". Panel deflections exceeded 1.0" under heat and load.
- 6.3.1.2 No valid data was taken and mone is presented. Failure of the panel under load prevented a rerun of the test.
- 6.3.2 Test observations, LT-5593-3-2 (Panel 25-20352-2)
- 6.3.2.1 A visual examination of the panel following the test did not reveal any damage.
- 6.3.3 Test observations, LT-5593-3-3 (Panel 25-20370-1)
- 6.3.3.1 A visual examination of the panel following the test did not reveal any damage.
- 6.4 Test observations, LT-5593-4
- 6.4.1 Test observations, LT-5593-4-1 (Panel 25-20374-1)
- The test was conducted as planned with a uniform load of 0.50 PS1 and a heating rate of approximately three degrees/second being applied until a plant lower failure occurred 577 seconds after the start of the test. This power failure caused heat to be lost from the eight control zones shown on Figures 225 through 233, Volume II. Following power return to the heating lamps, the panel was heated at a rate over one-hundred degrees/second as the computer attempted to return to the heating curve.
- Between the time of power failure and return to the heating curve the corrugations of 1/2 the panel (zone 5) buckled at the upper crests at their beam centerline. Because power to the lamps of the different zones could not be restored to the panel concurrently, temperature gradients may have induced enough thermal stress to cause the failure in zone 5. The maximum gradient, approximately 1040°F, occurred between zone 1 and zone 5 at the test time of 602 seconds. Note that the control thermocouple temperature curve on Figure 229, Volume II, represents the temperature of the zone 4 region adjacent to zone 6 only.

Additional study of the data indicates the possibility of penel failure occurring in zone 5 prior to the failure time as indicated by a deflection indicator (reference Figure 223, Volume II) located near the center of the panel. Flagnote 1 on Figure 230, Volume II, points out that the control thermocouple for zone 5 indicates that the panel lost temperature as it was being reheated following the restoration of plant power.

6.4.1.2 (Continued)

One probable explanation is that the control thermocouple moved away from the heat lamps as the corrugations failed in the area of zone 5. The failure of the corrugations in zone 5, detected in this manner, would then have occurred approximately 29 seconds prior to the failure as indicated by the deflection near the center of the panel nine inches away.

- 6.4.2 Test observations, LT-5593-4-2 (Panel 25-20374-2)
- 6.4.2.1 The panel failure consisted of buckling of the corrugations and "caving in" of the panel.
- 6.4.2.2 Photographs of panel damage are on Figures 44 through 48, Volume I.
- 6.4.3 Test observations, LT-5593-4-3 (Panel 25-20352-1)
- 6.4.3.1 The unsymmetrical heat cycle produced no visible damage.
- 6.4.3.2 Panel damage due to pressure is shown in the photographs, Figures 49 through 52, Volume I.
- 6.4.4 Test observations, LT-5593-4-4 (Panel 25-20370-2)
- 6.4.4.1 The unsymmetrical heat cycle resulted in damage as shown on Figures 53 and 54, Volume I.
- 6.4.4.2 Panel damage is shown in the photographs on Figures 55, 56 and 57, Volume I.
- 6.4.5 Test observations, LT-5593-4-5 (Panel 25-20352-2)
- 6.4.5.1 The test panel failed under pressure as shown on Figures 58, 59 and 60, Volume I.
- 6.4.6 Test observations, LT-5593-4-6 (Panel 25-20370-1)
- 6.4.6.1 The test panel failed under pressure as shown on Figures 61 through 64, Volume I.
- 6.5 Test observations, LT-5593-5 (Panel 25-20344-1, No. 1477)
- 6.5.1 Figure 259, Volume II, shows the effect of sound angle of incidence on panel amplitude response. The Dyna-Soar sonic fatigue program has been setup to test specimens at 0° (grazing) incidence.

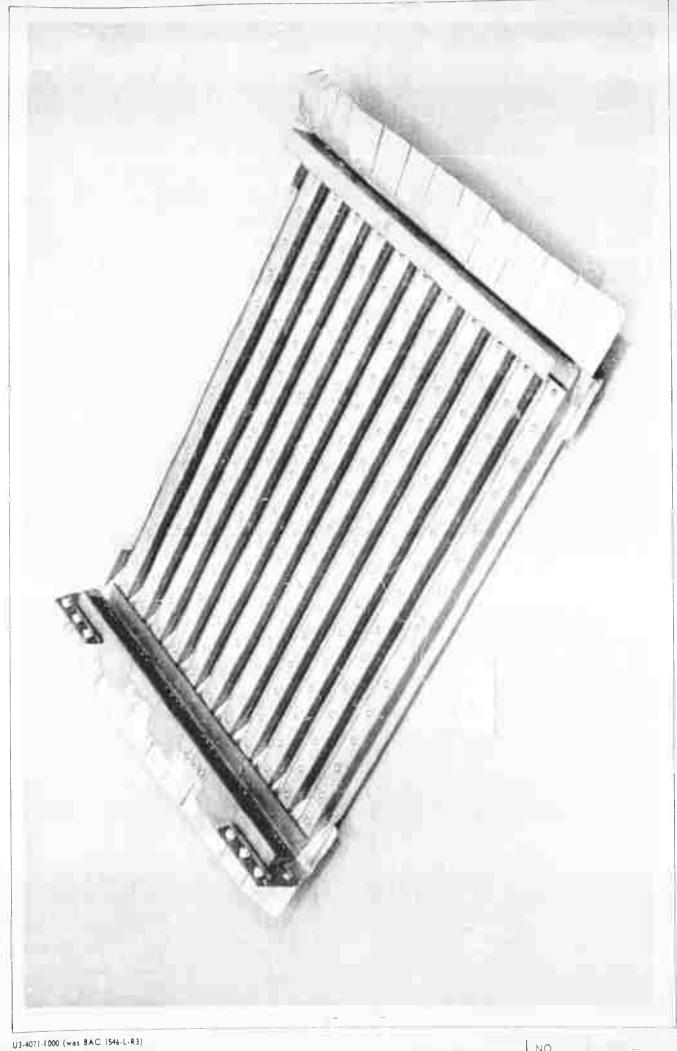
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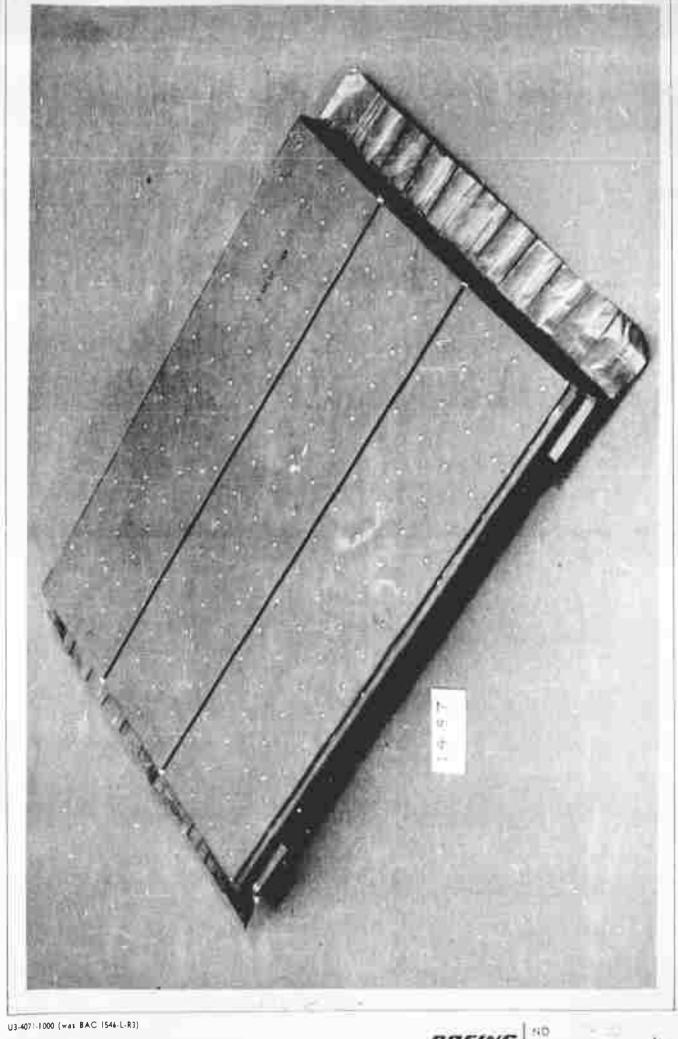
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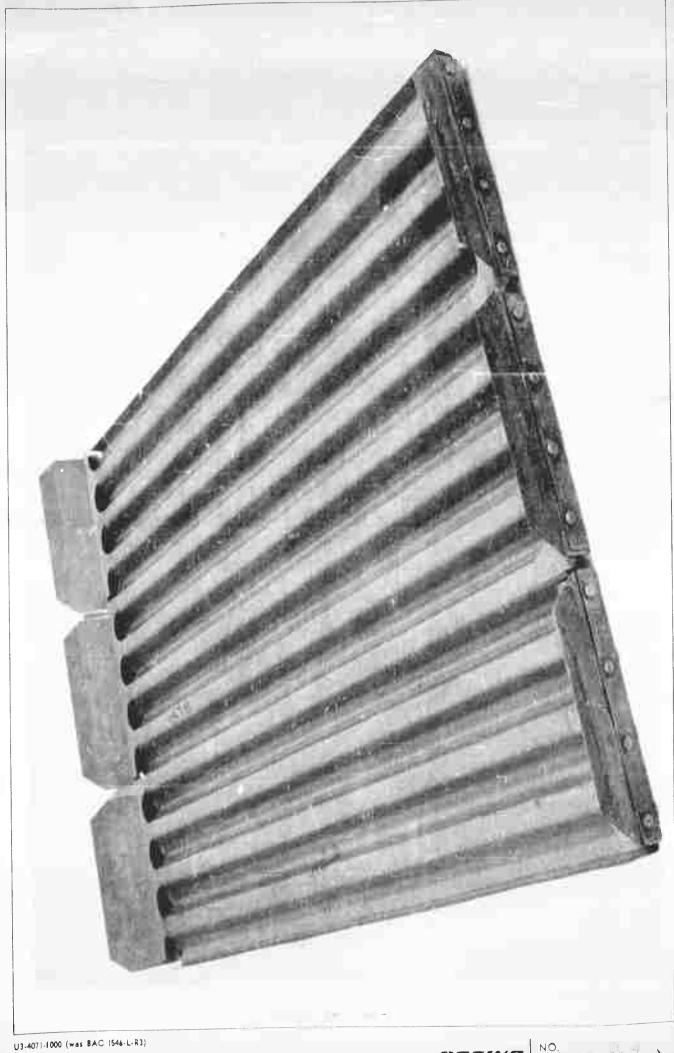


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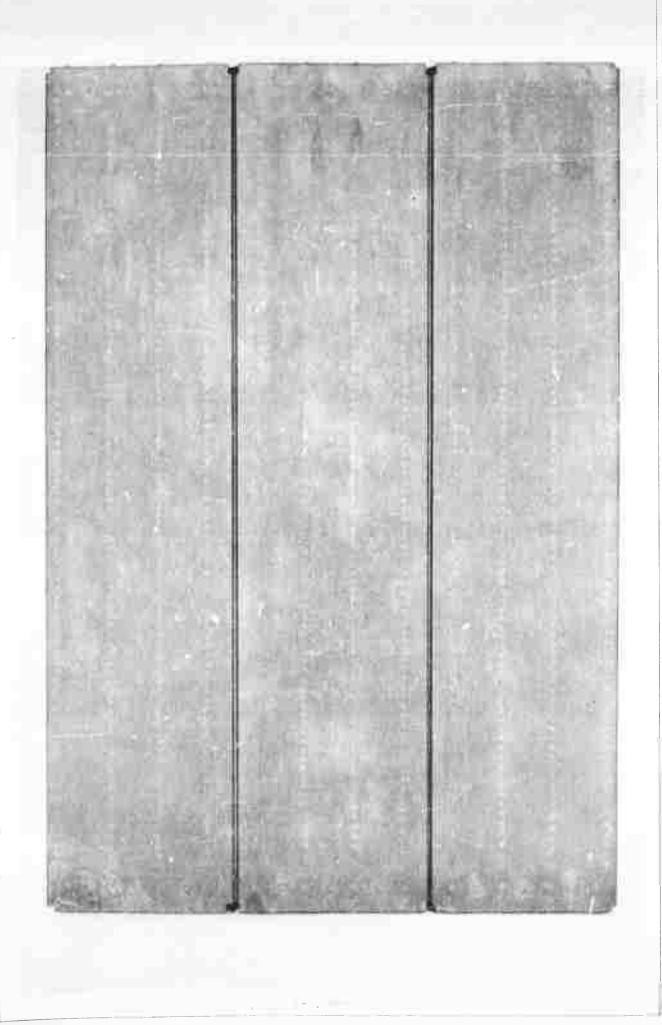


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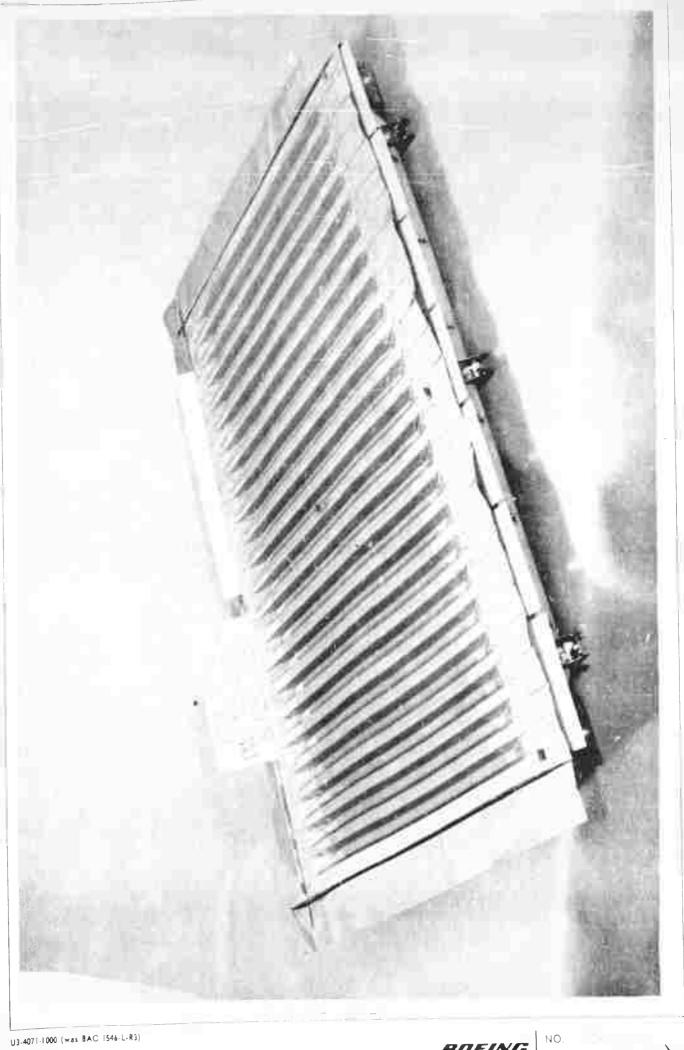
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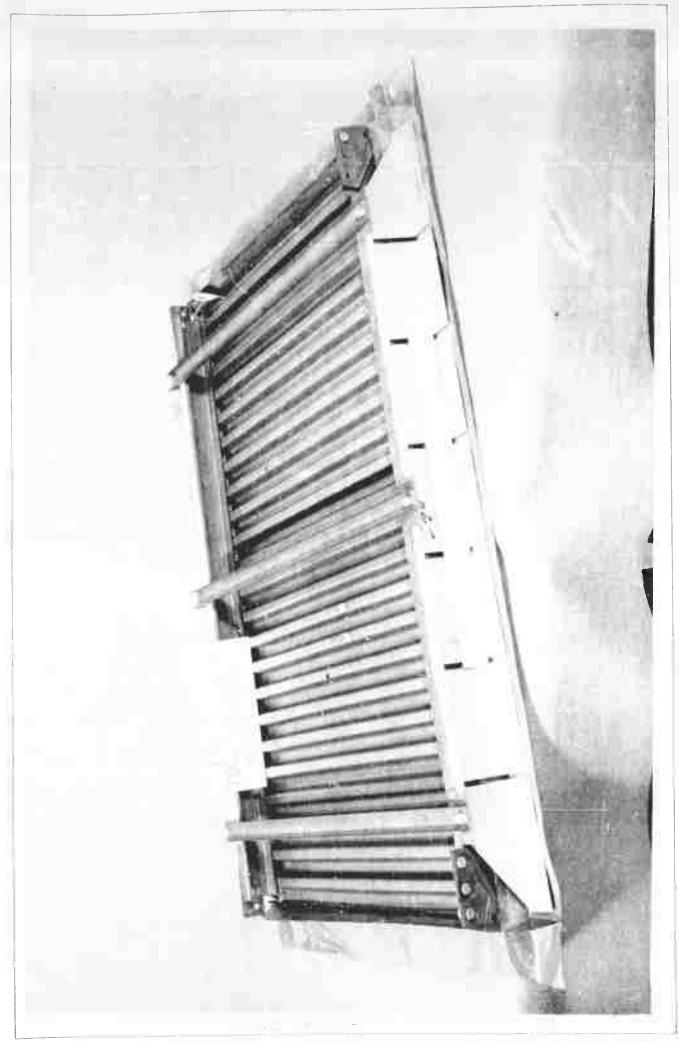
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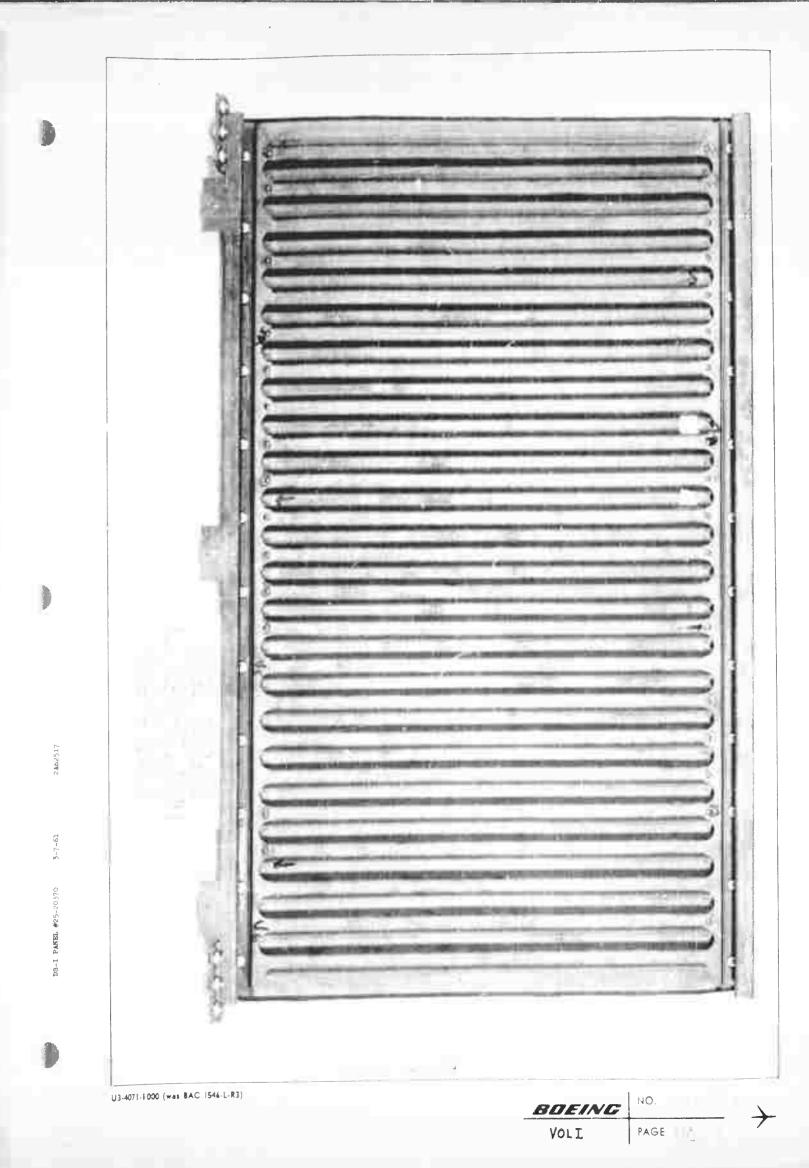


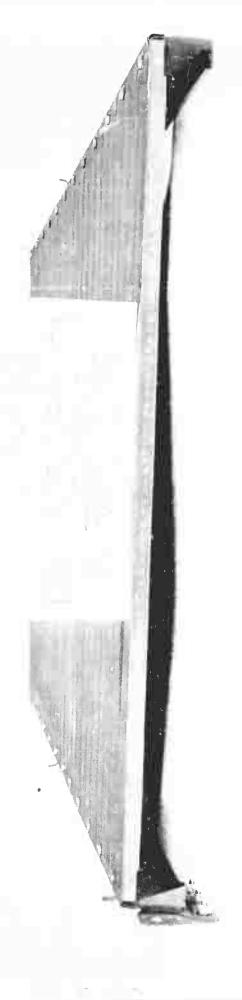




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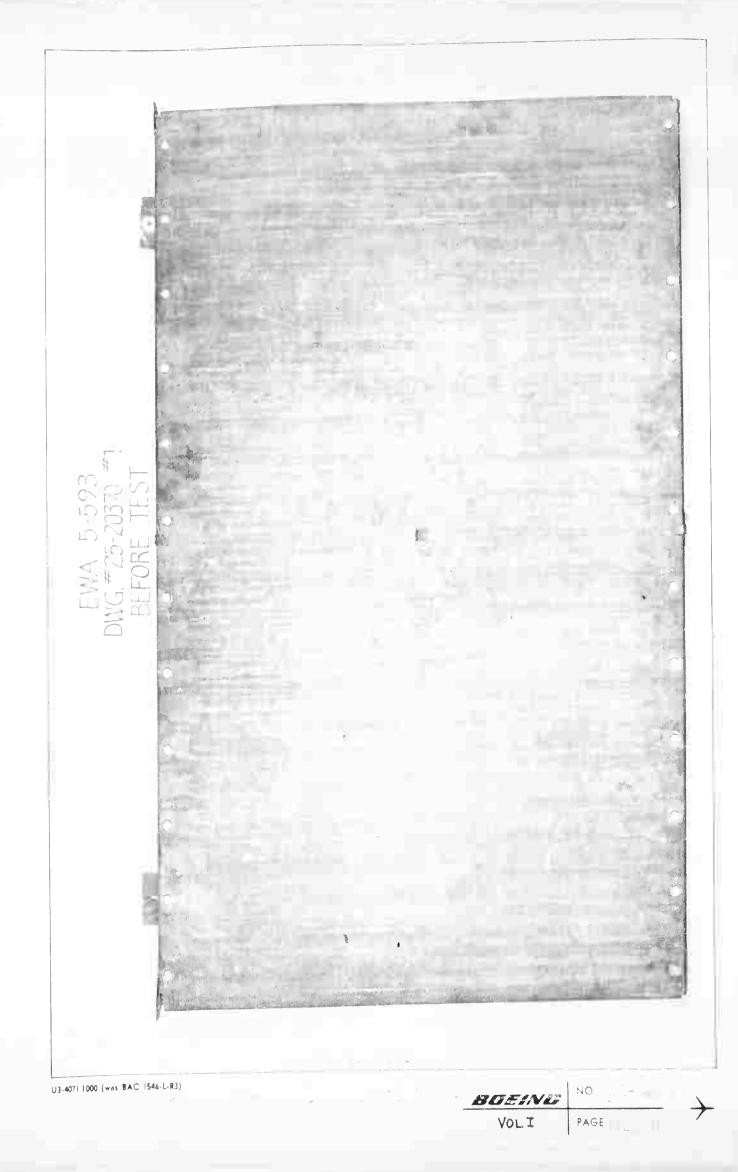




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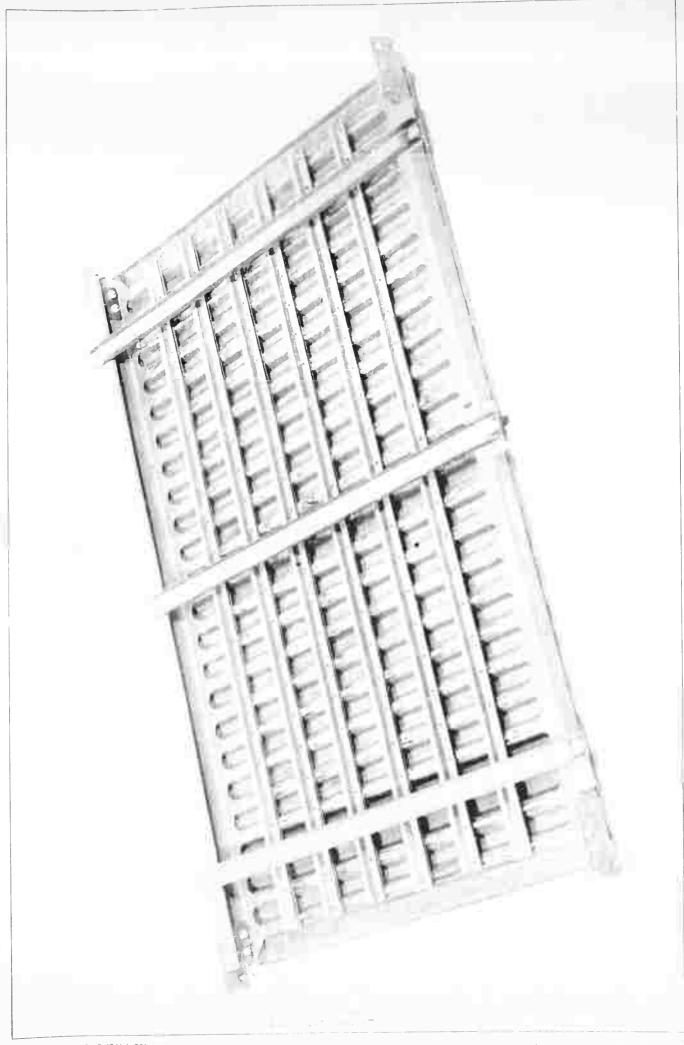
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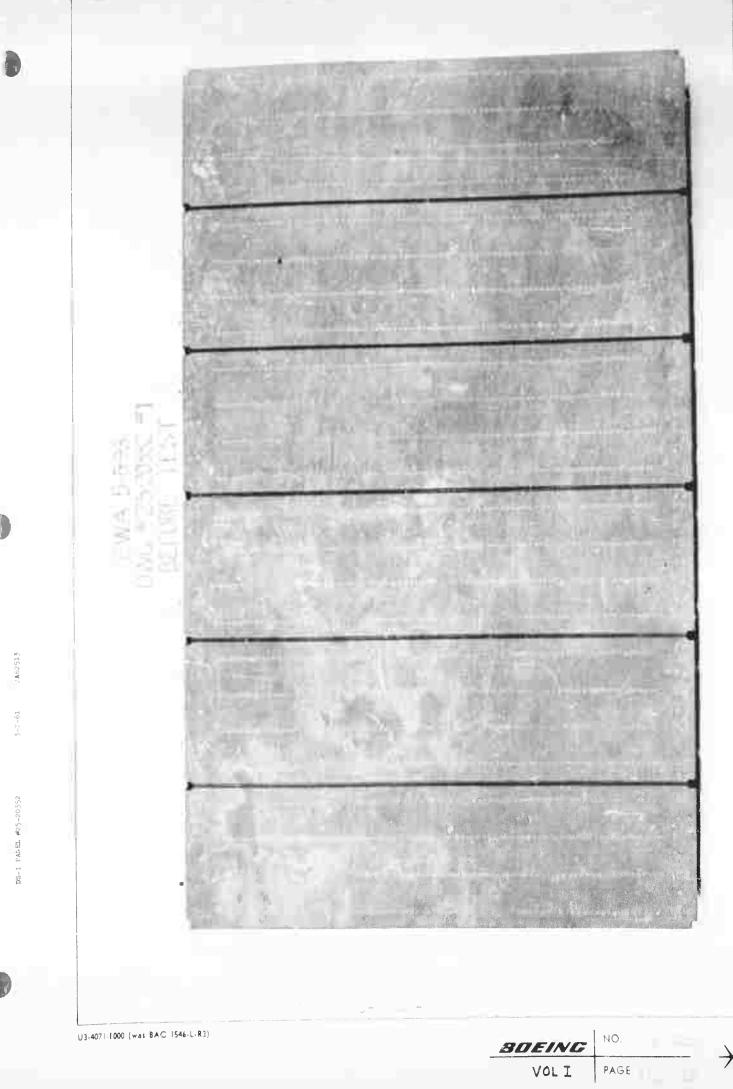


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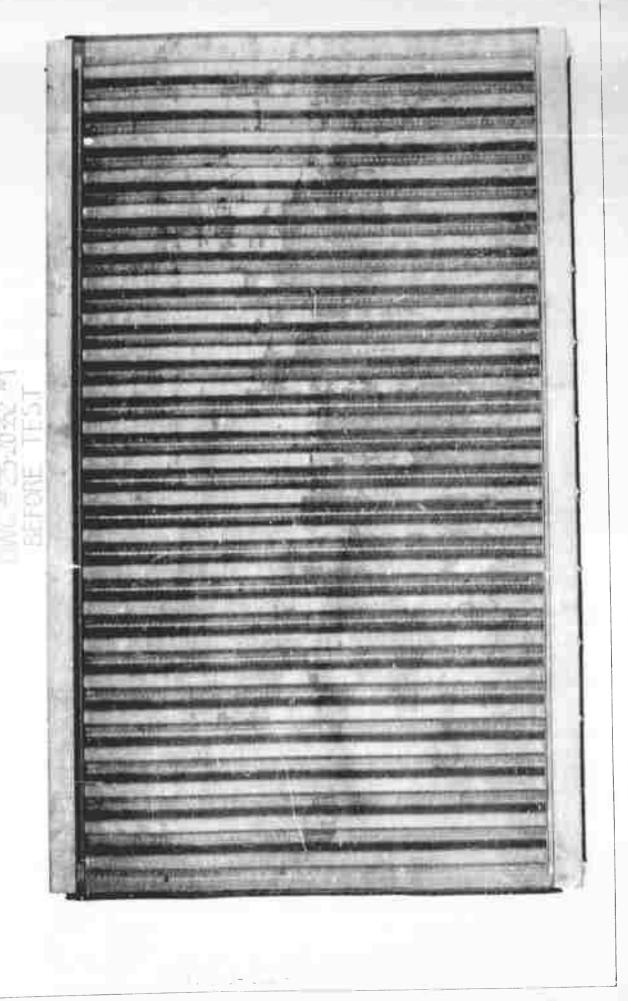




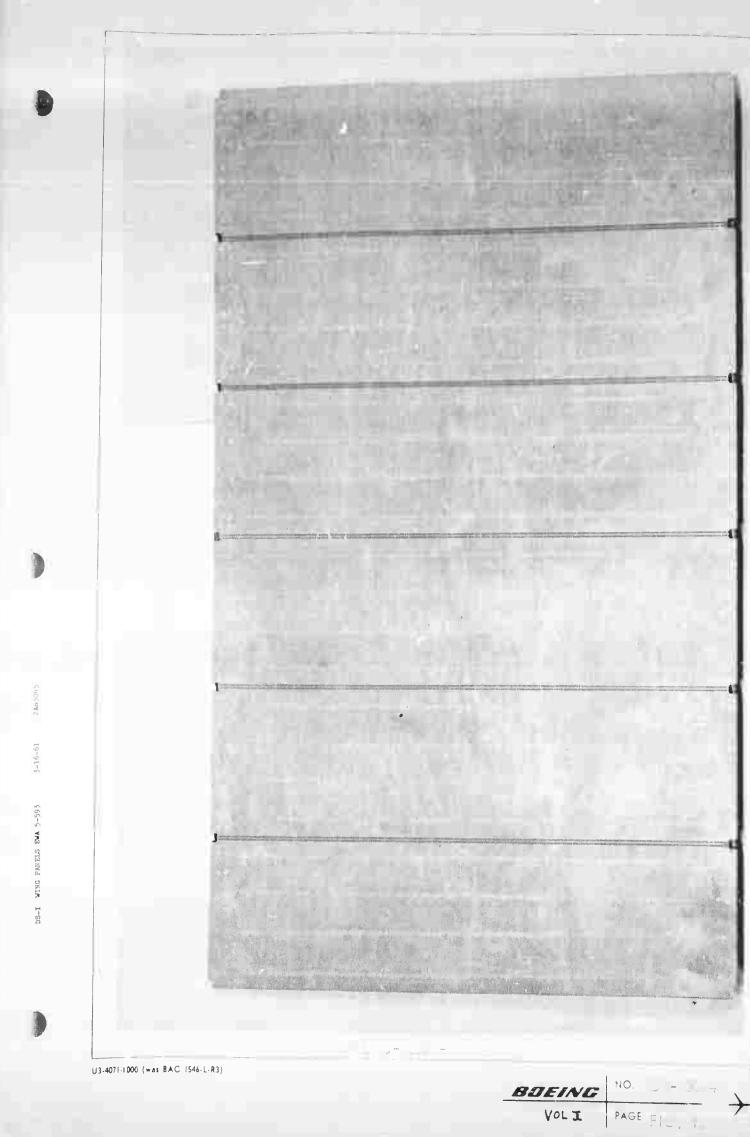
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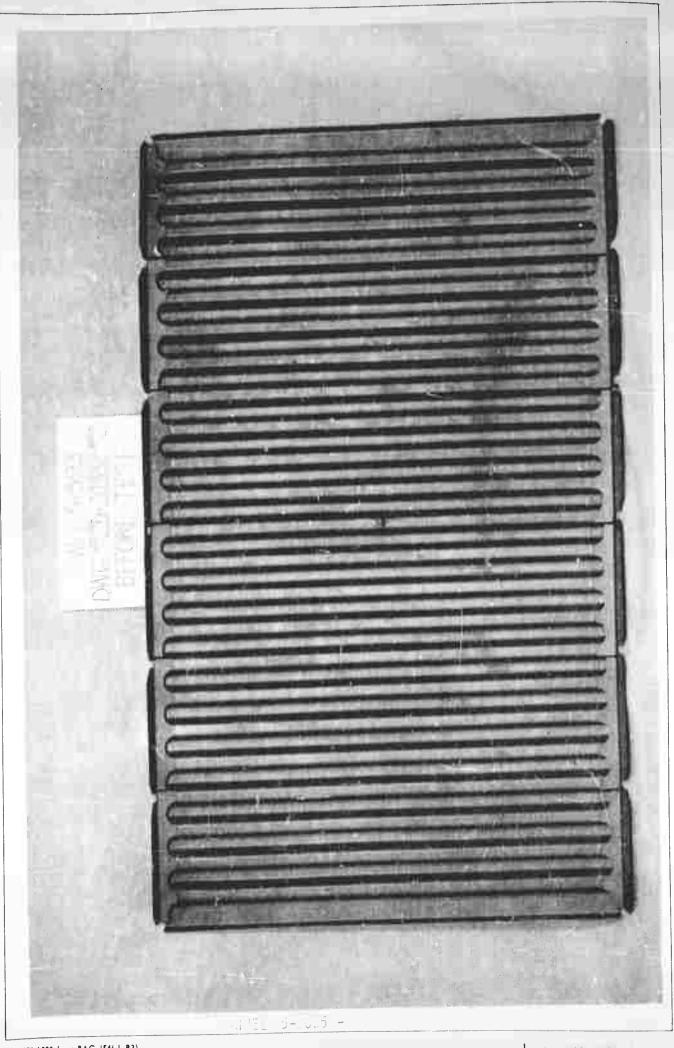
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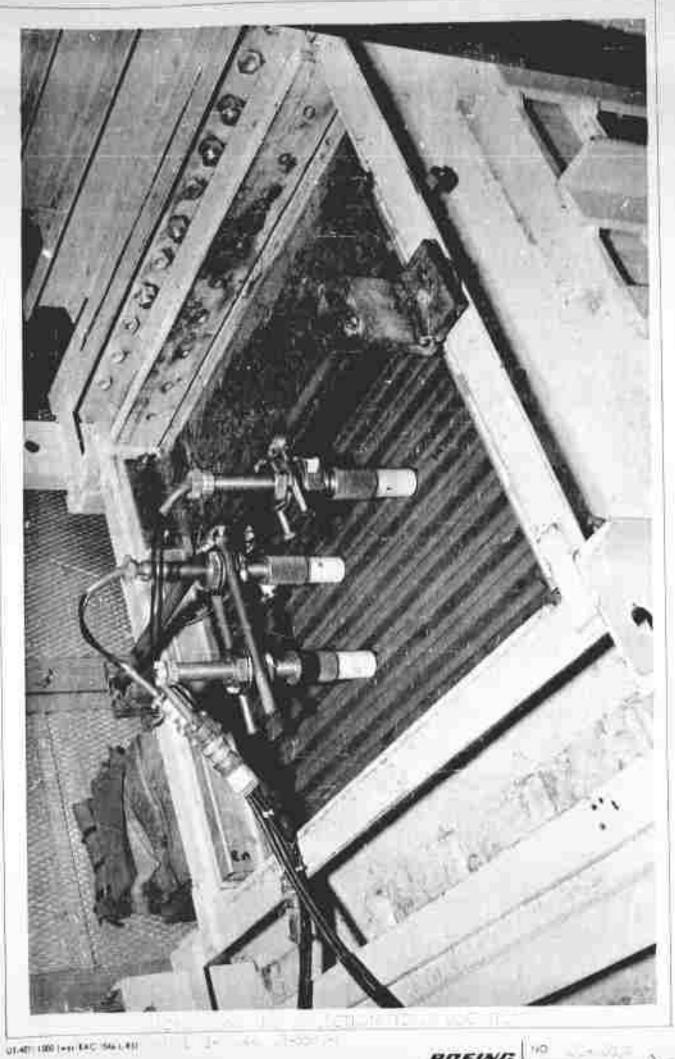


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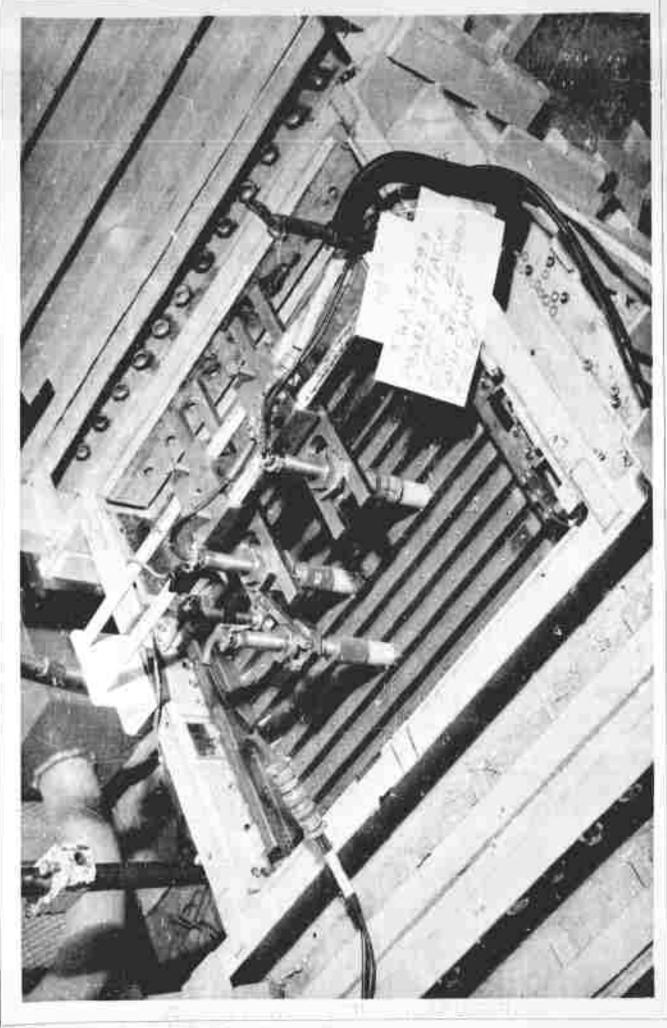
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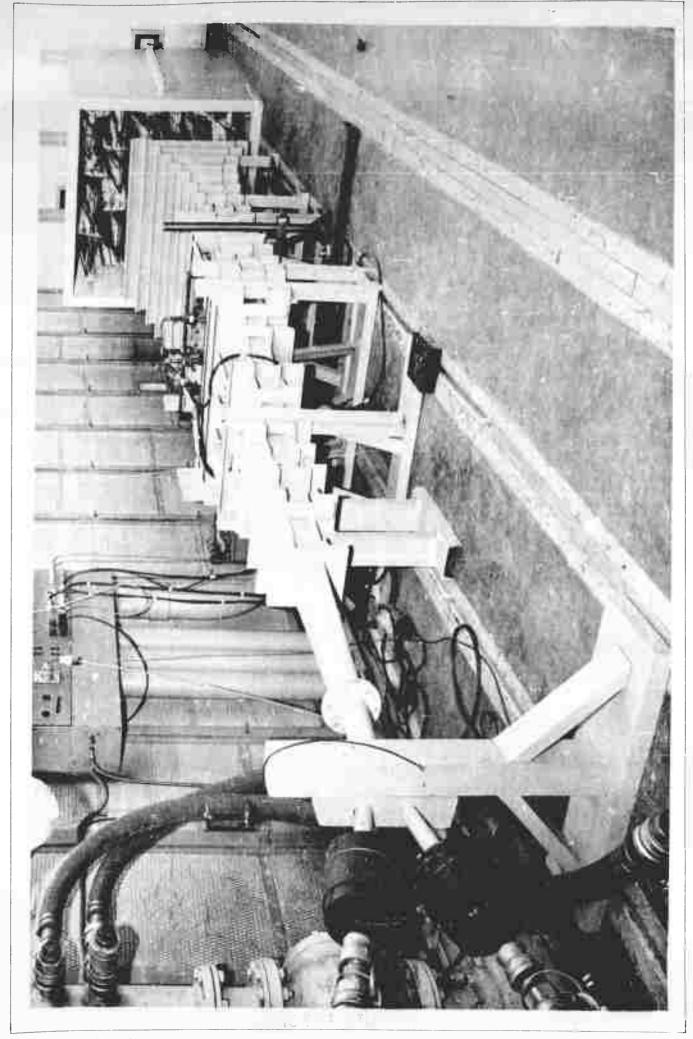
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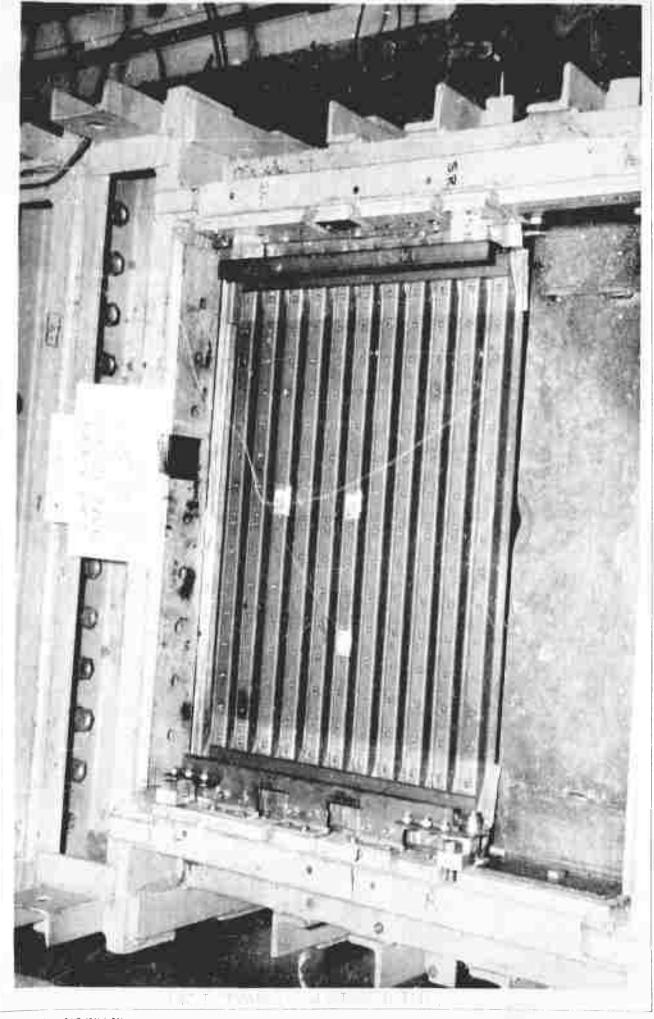




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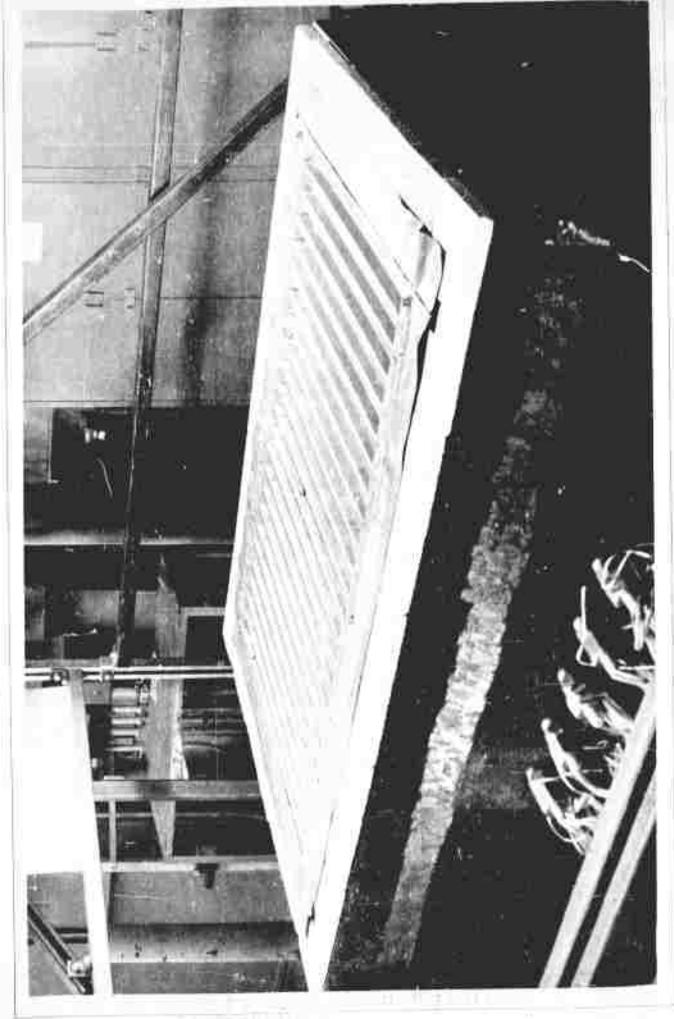
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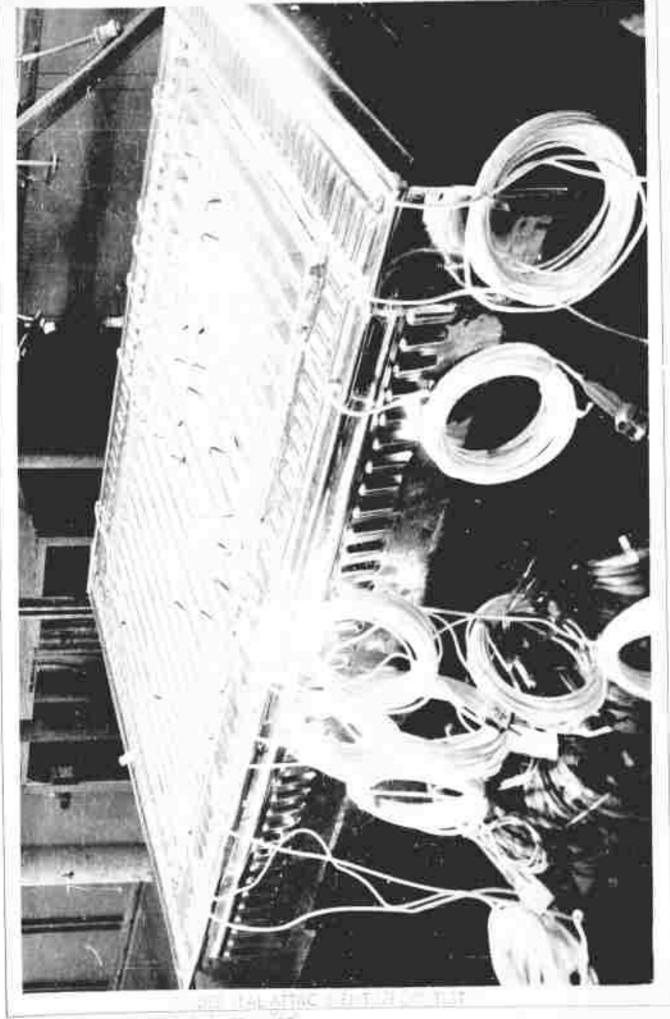


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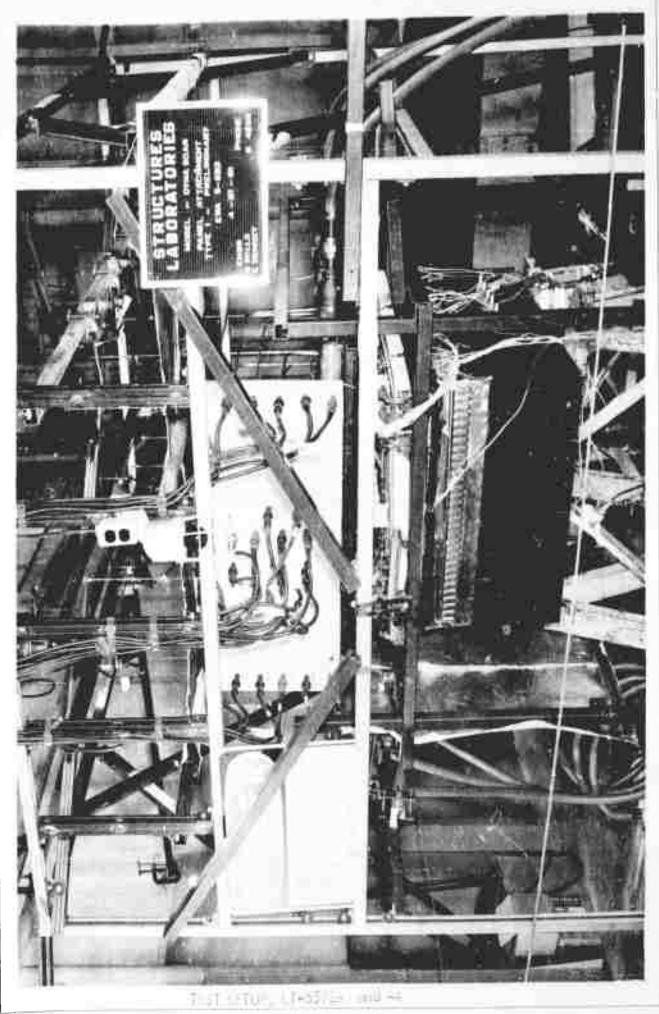
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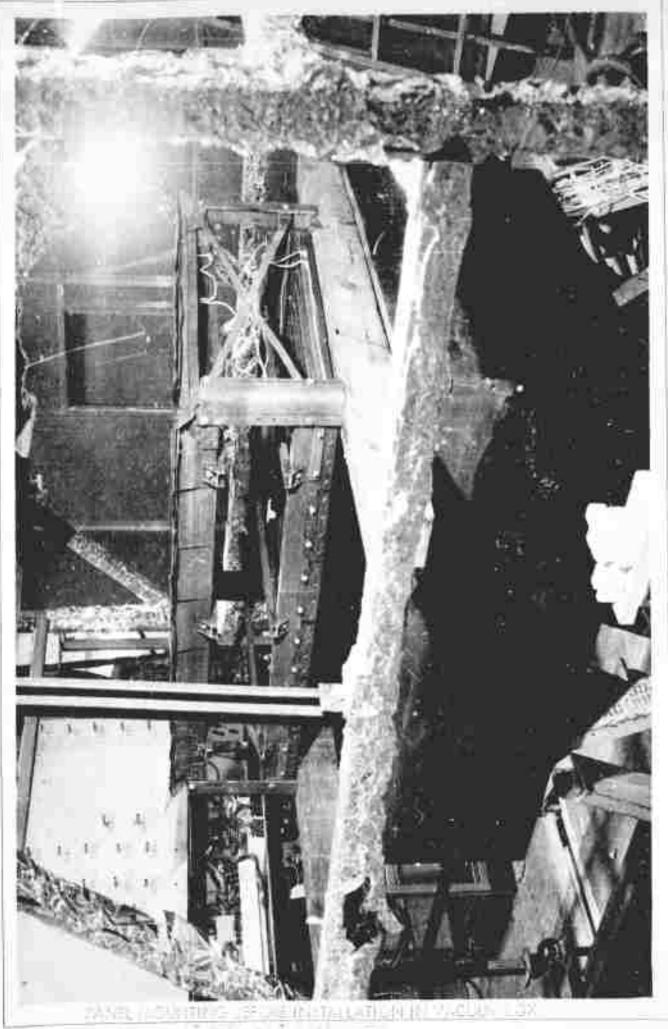
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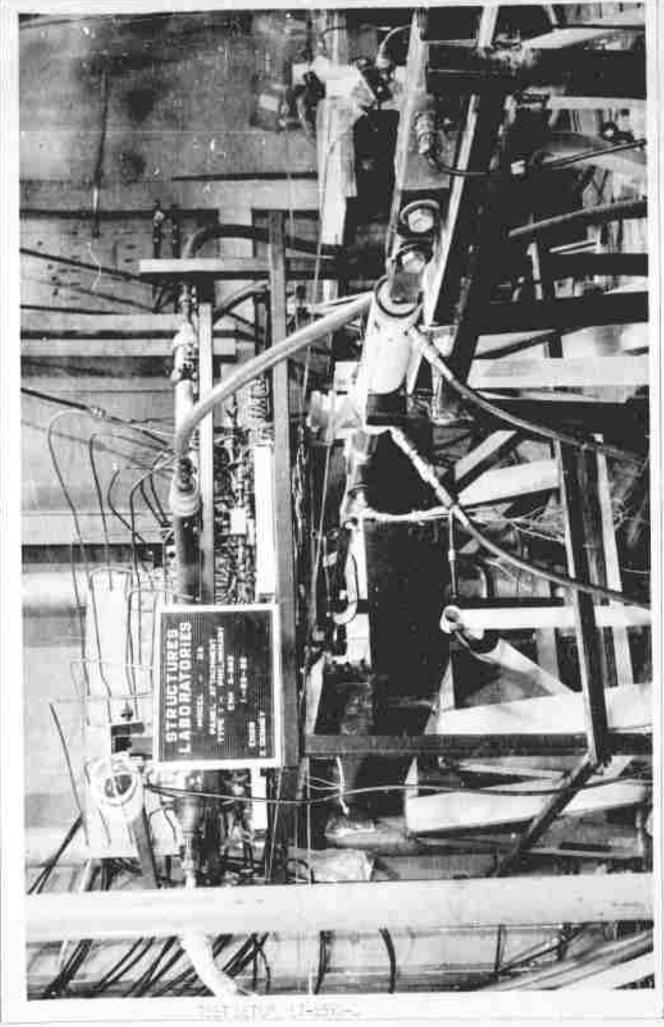
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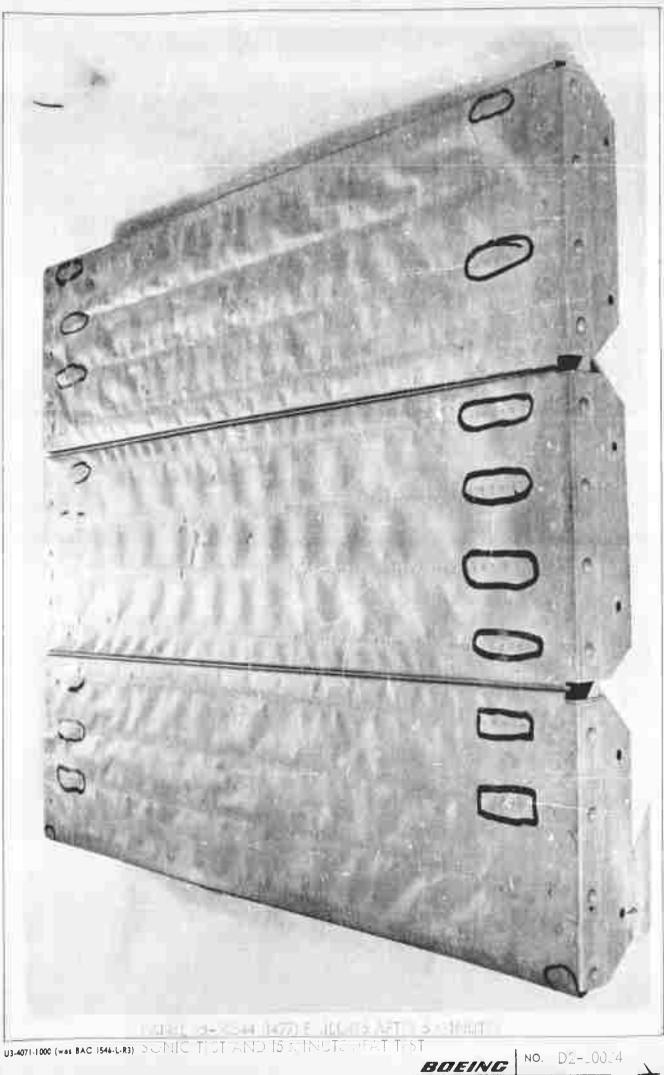
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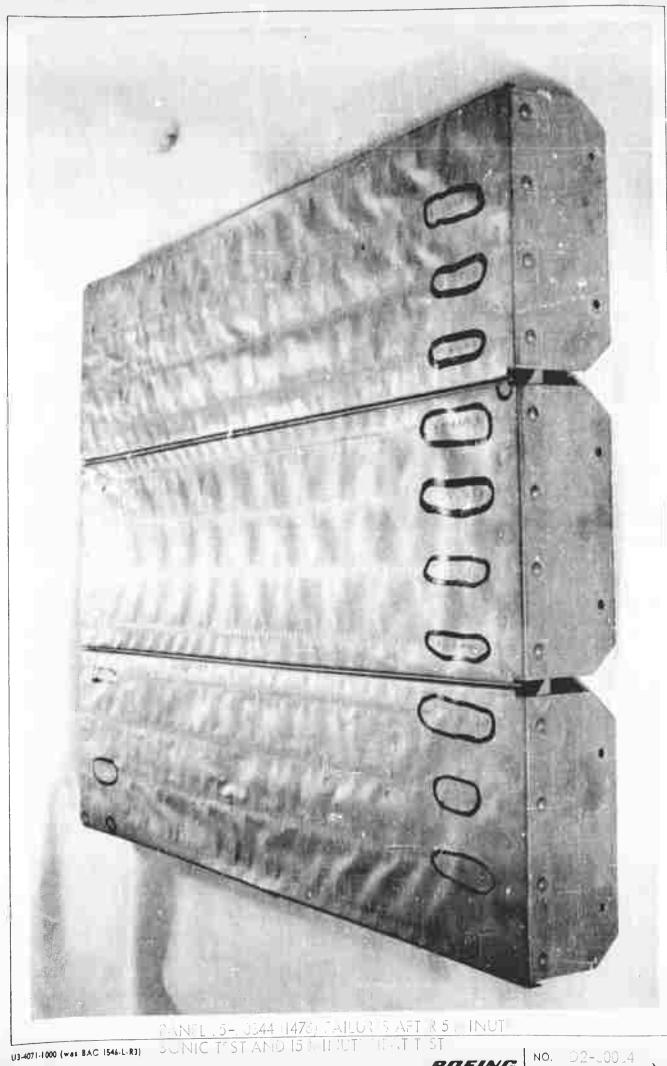
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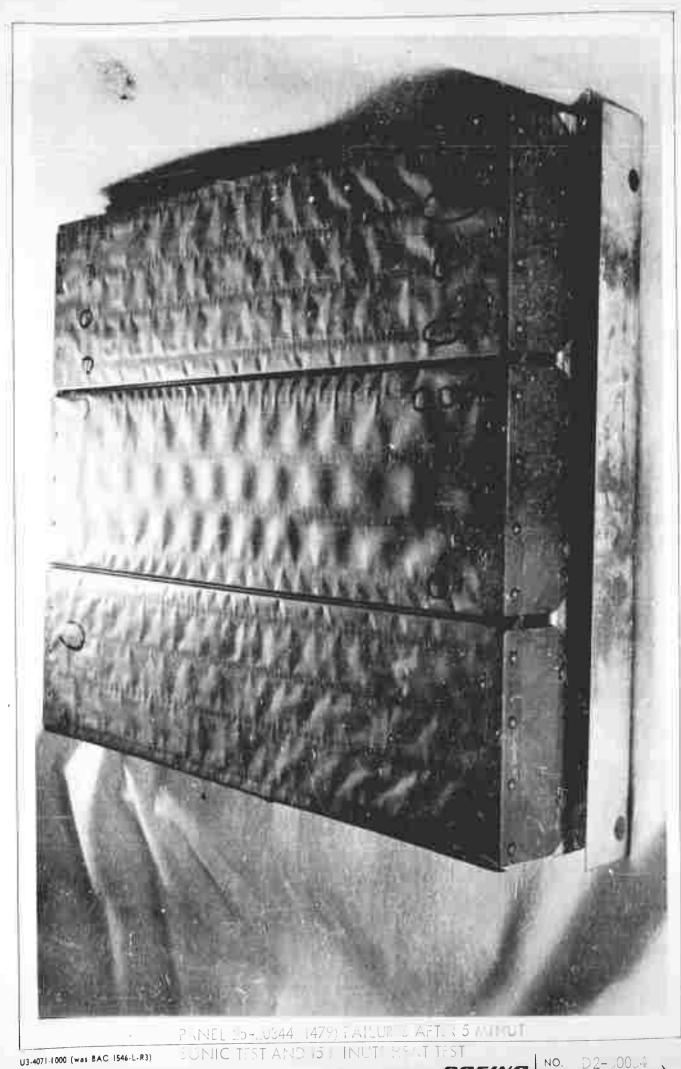
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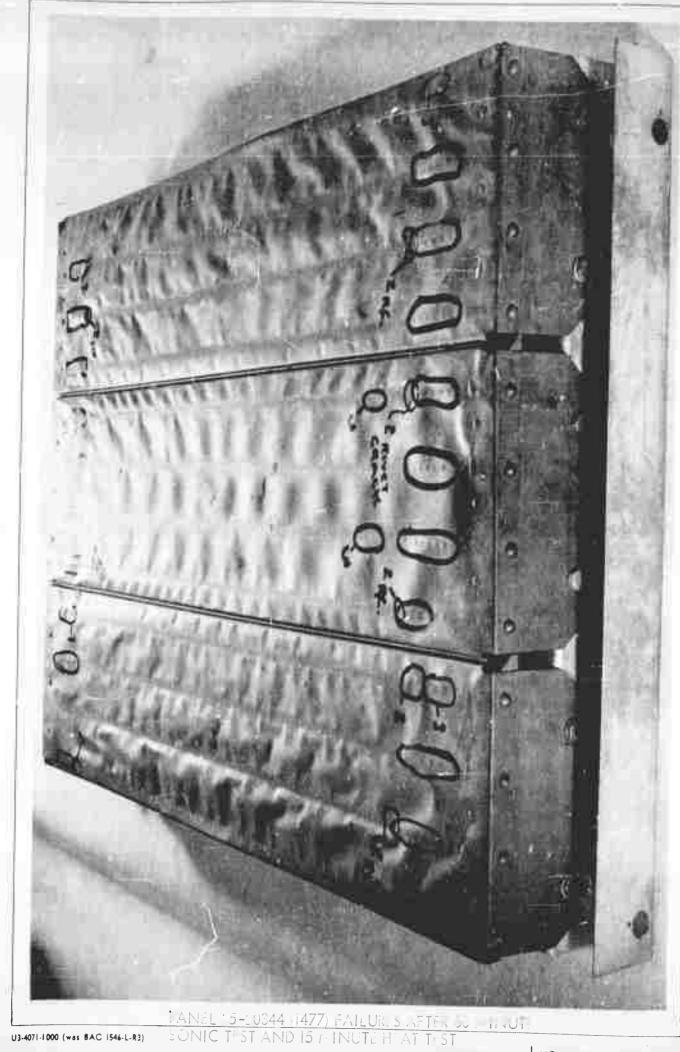
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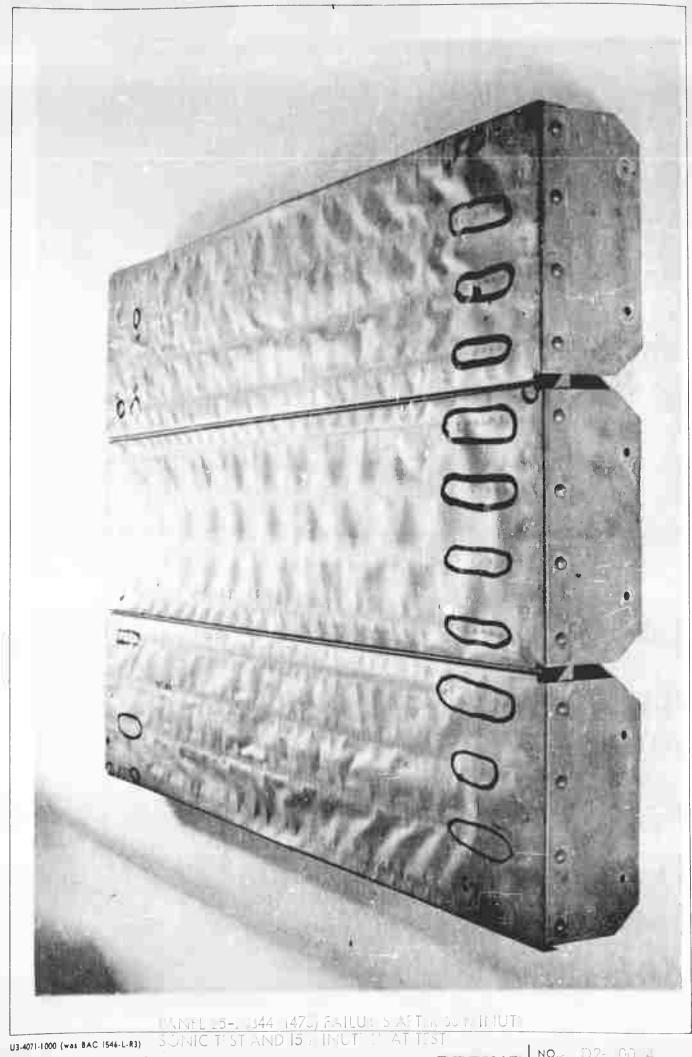
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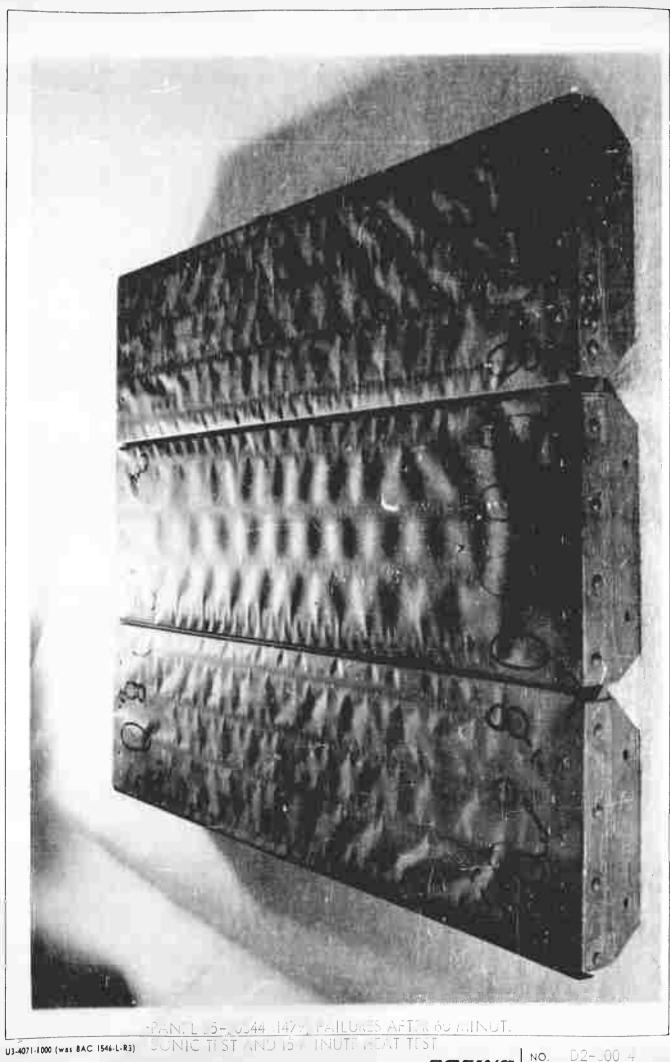
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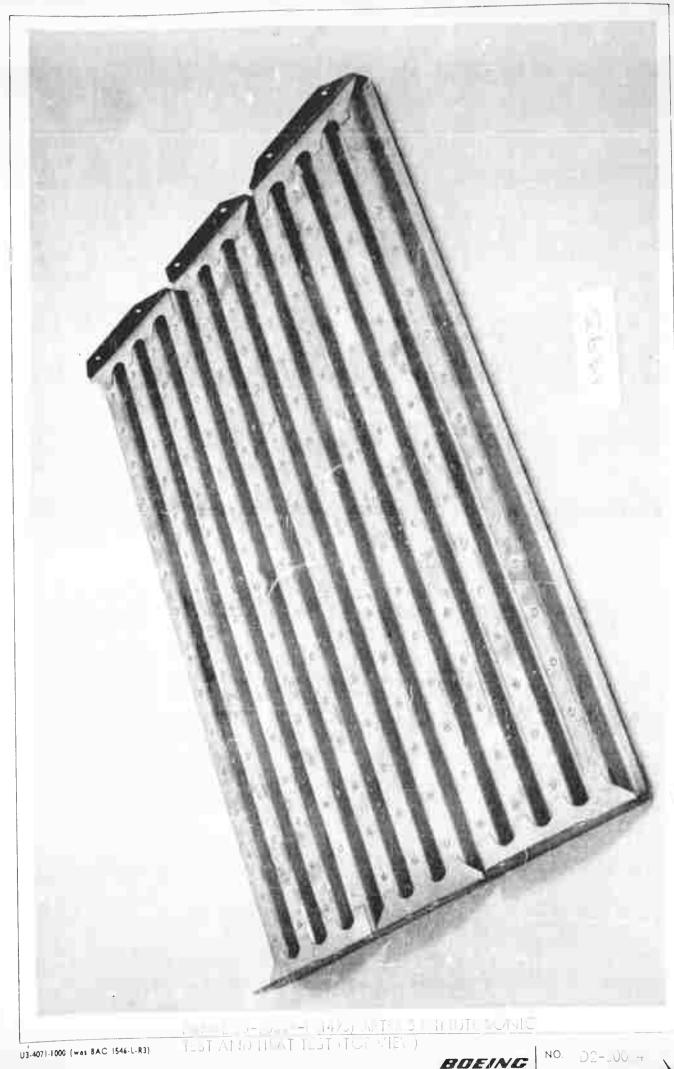
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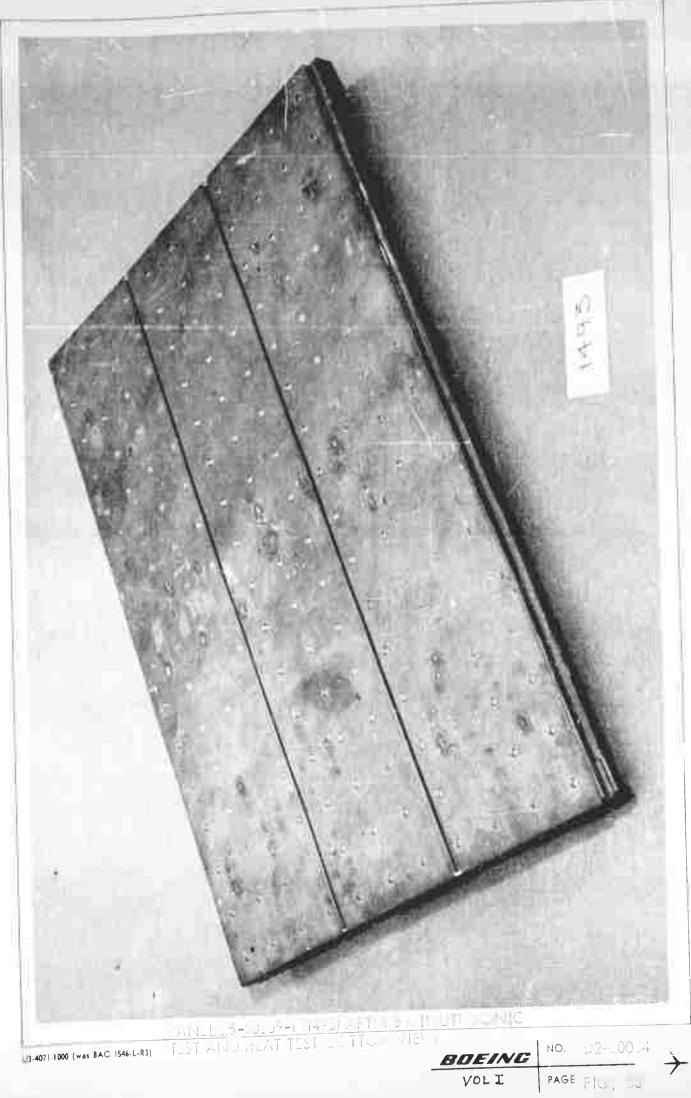
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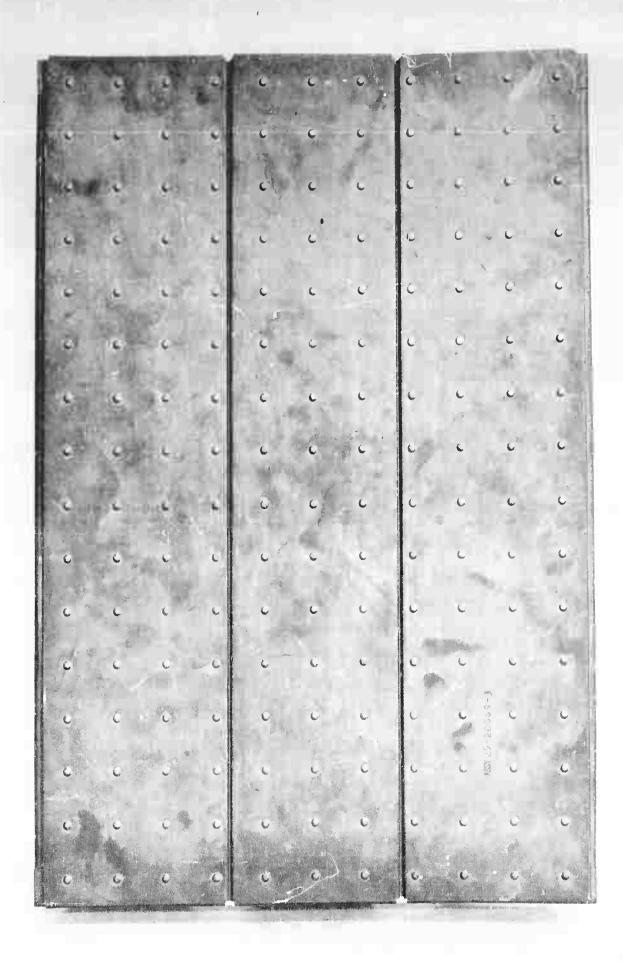
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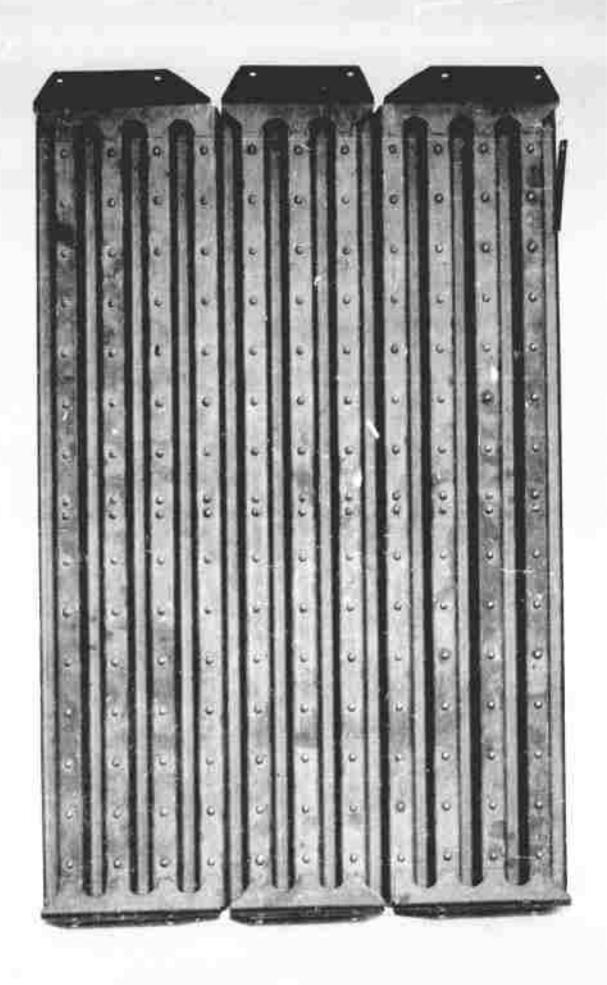
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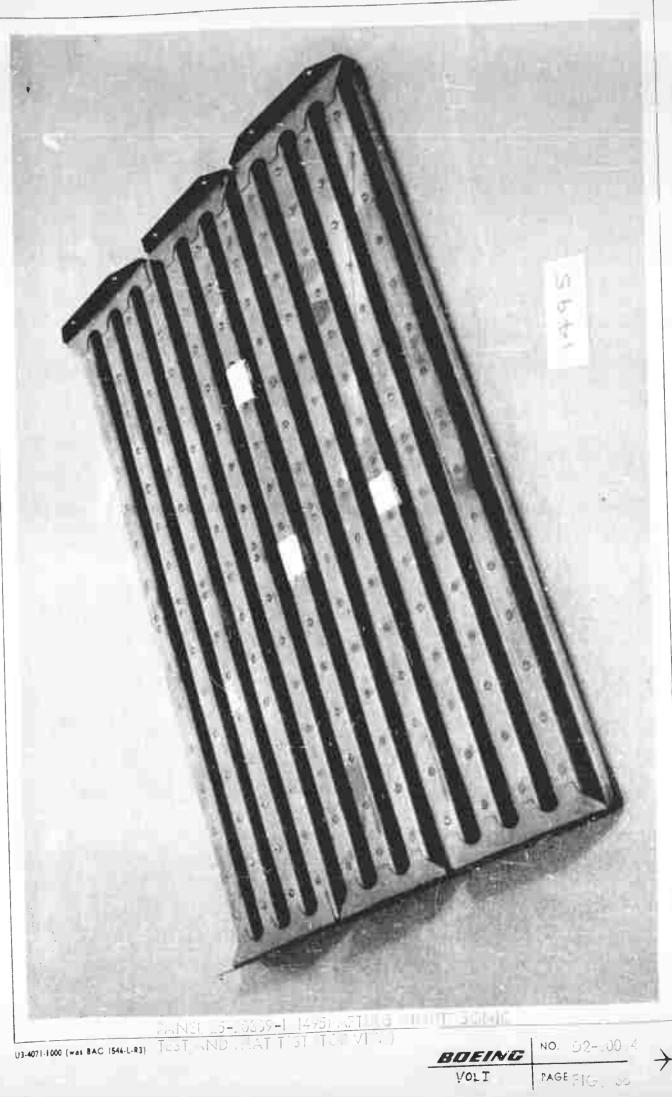


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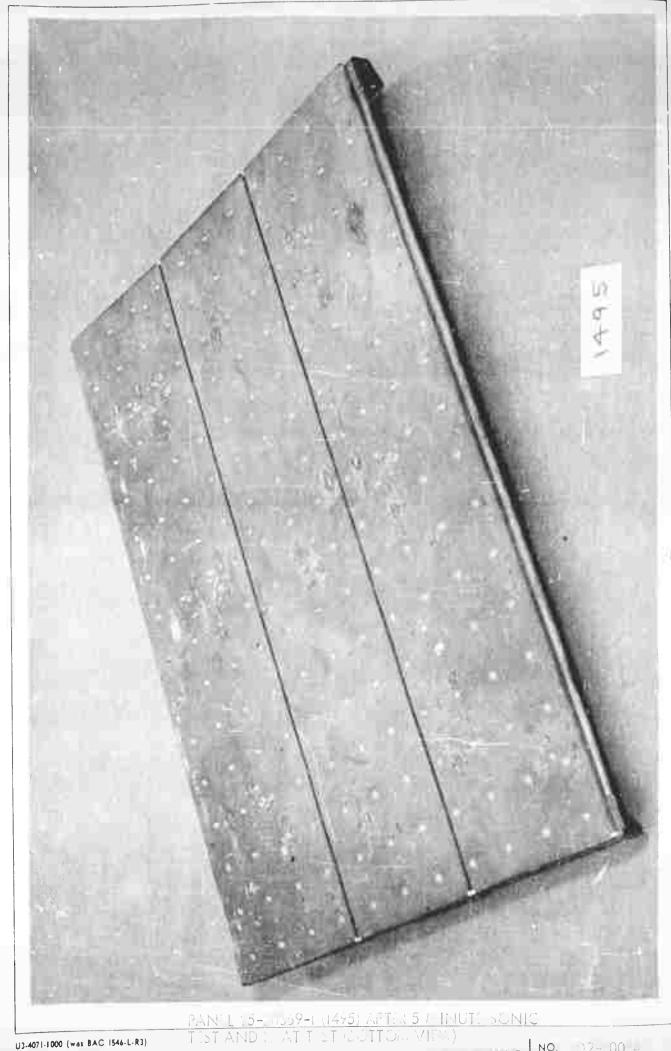
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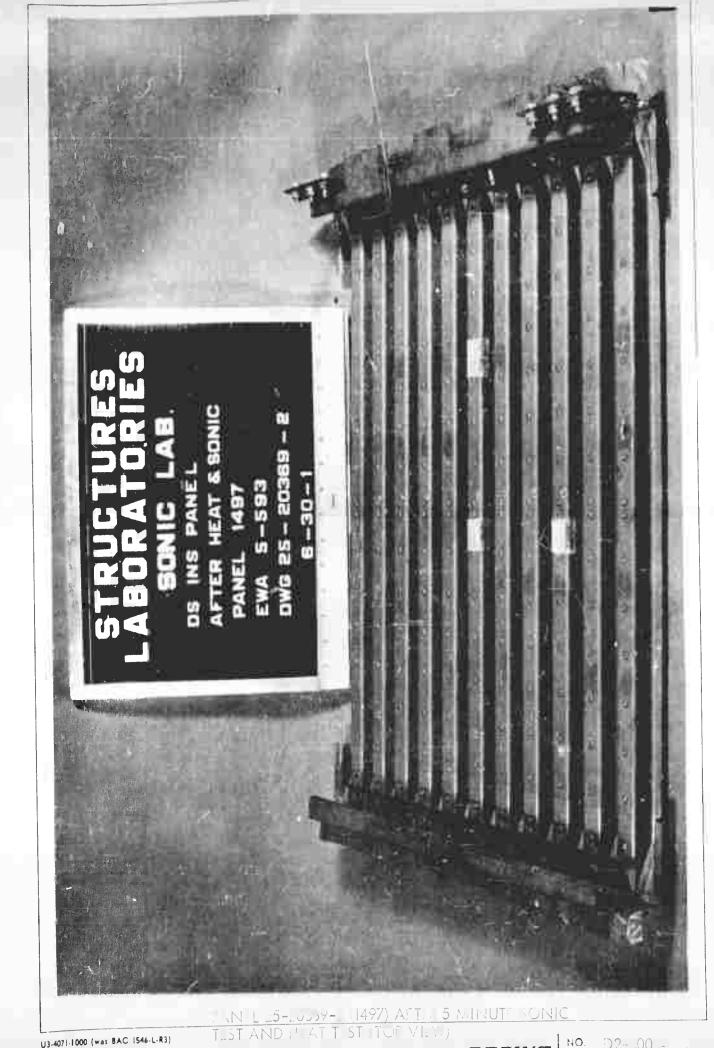
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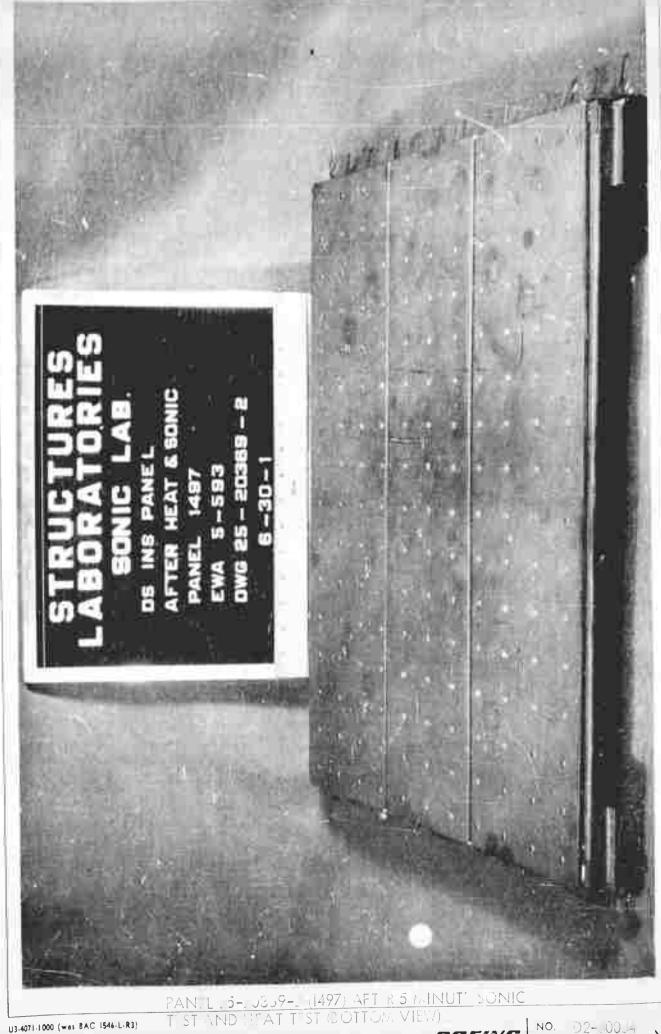




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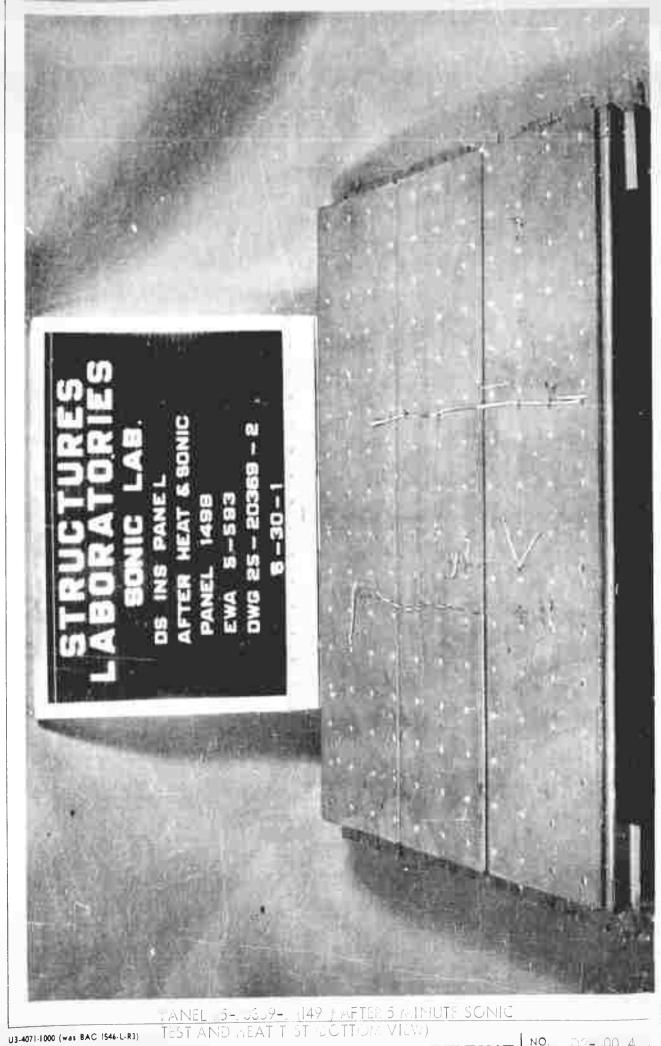
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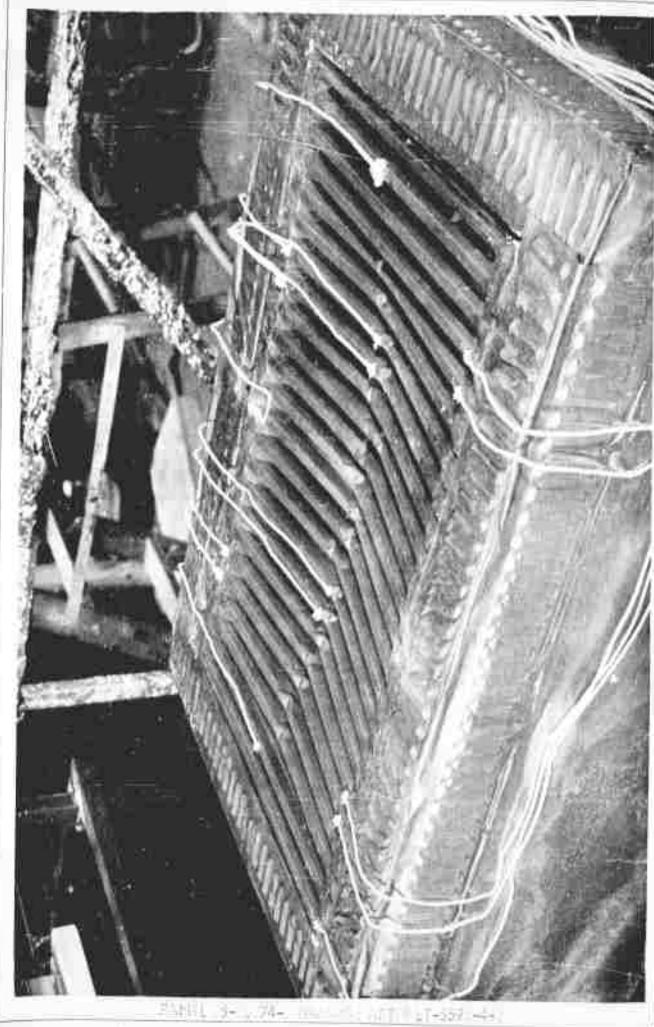
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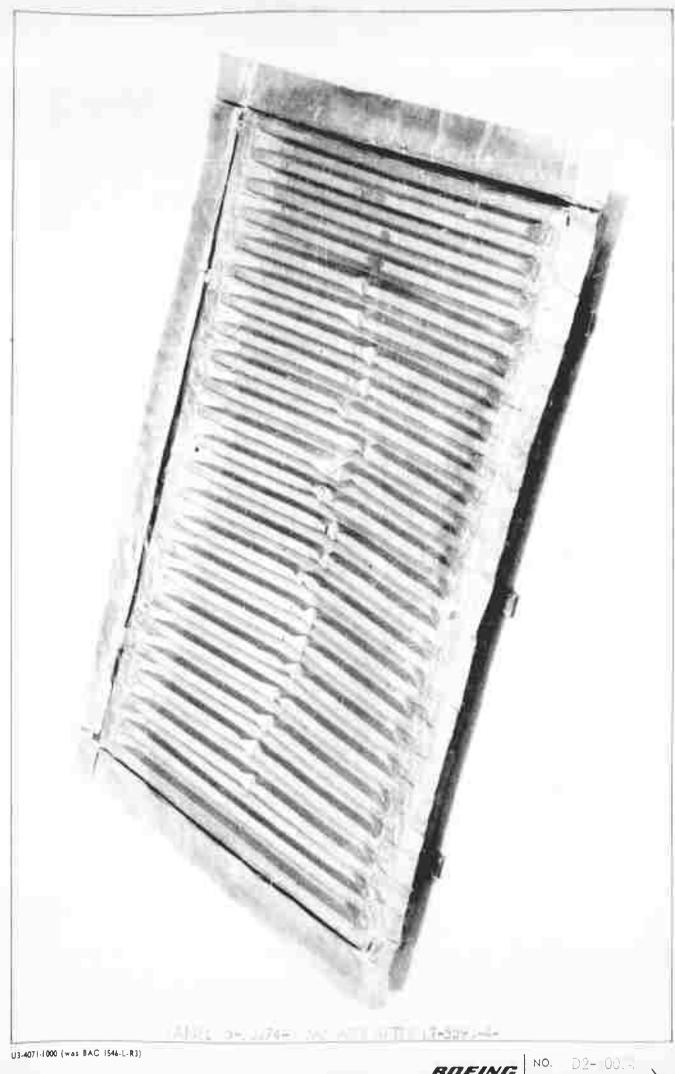
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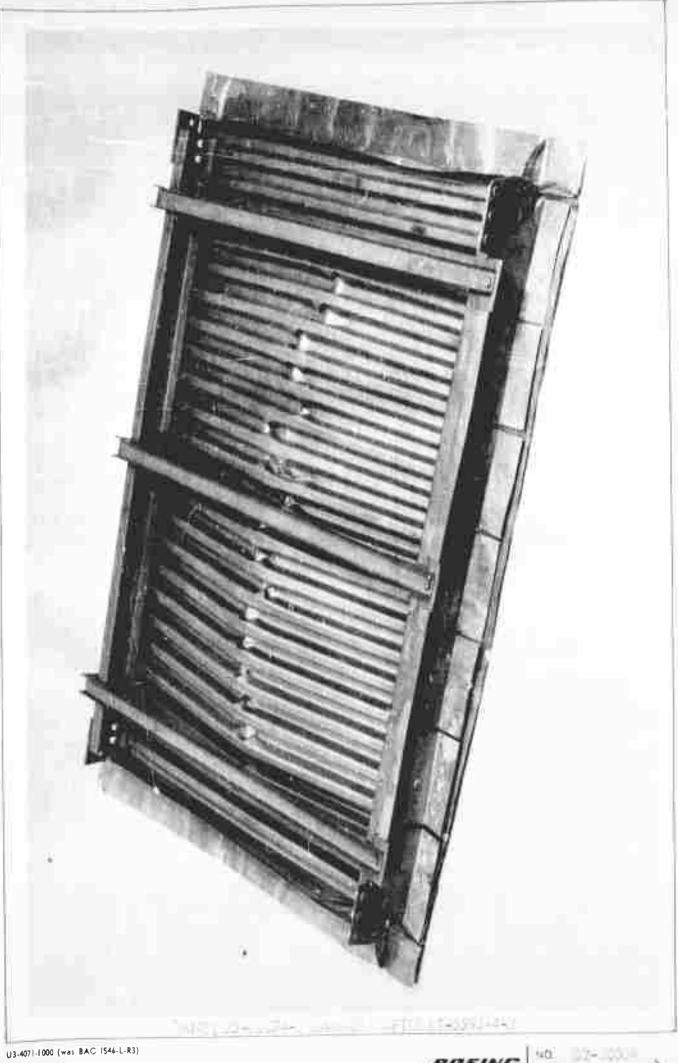


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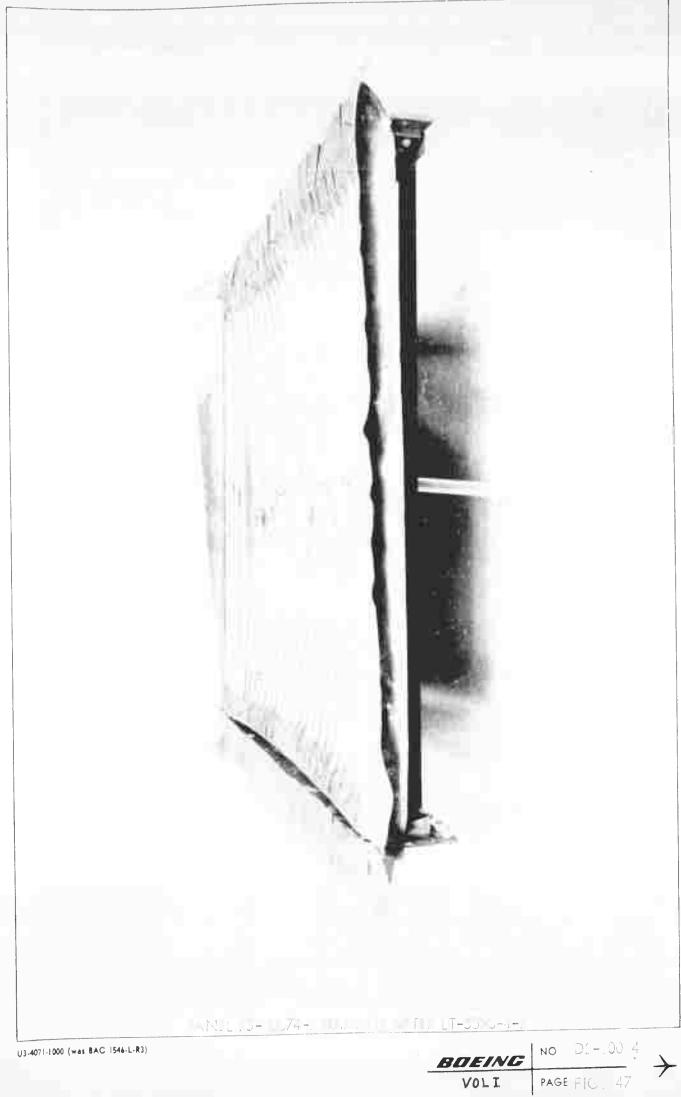
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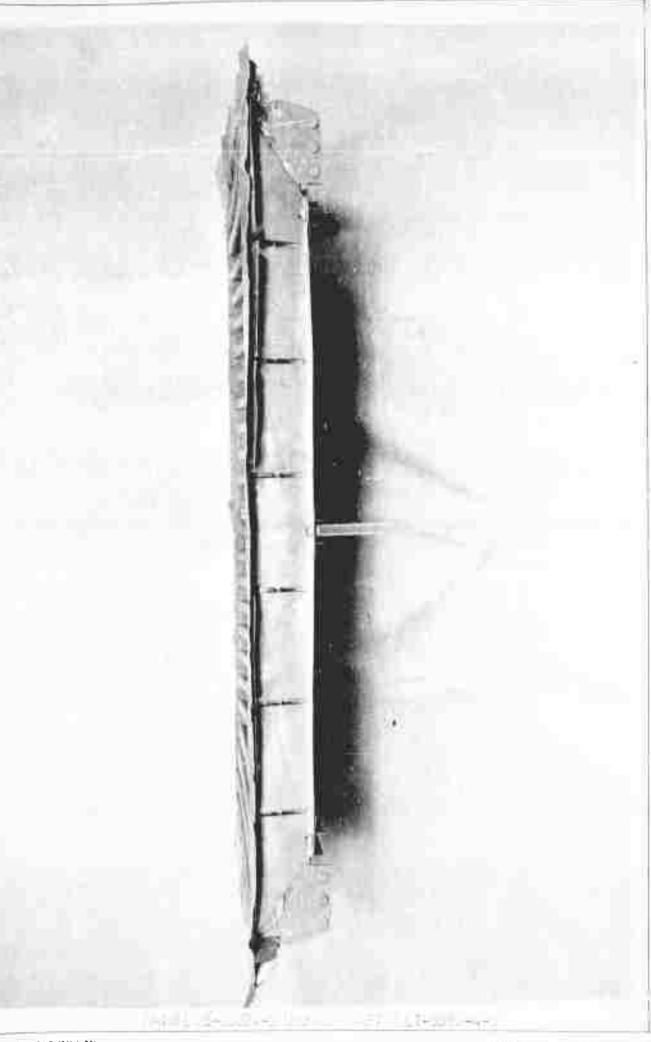


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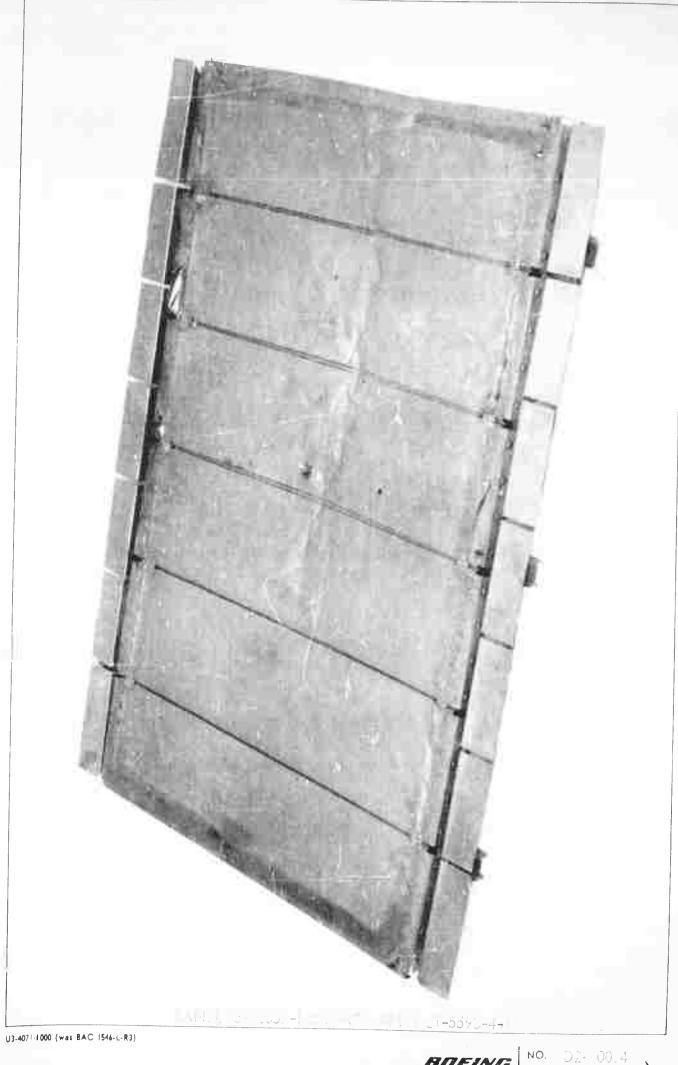
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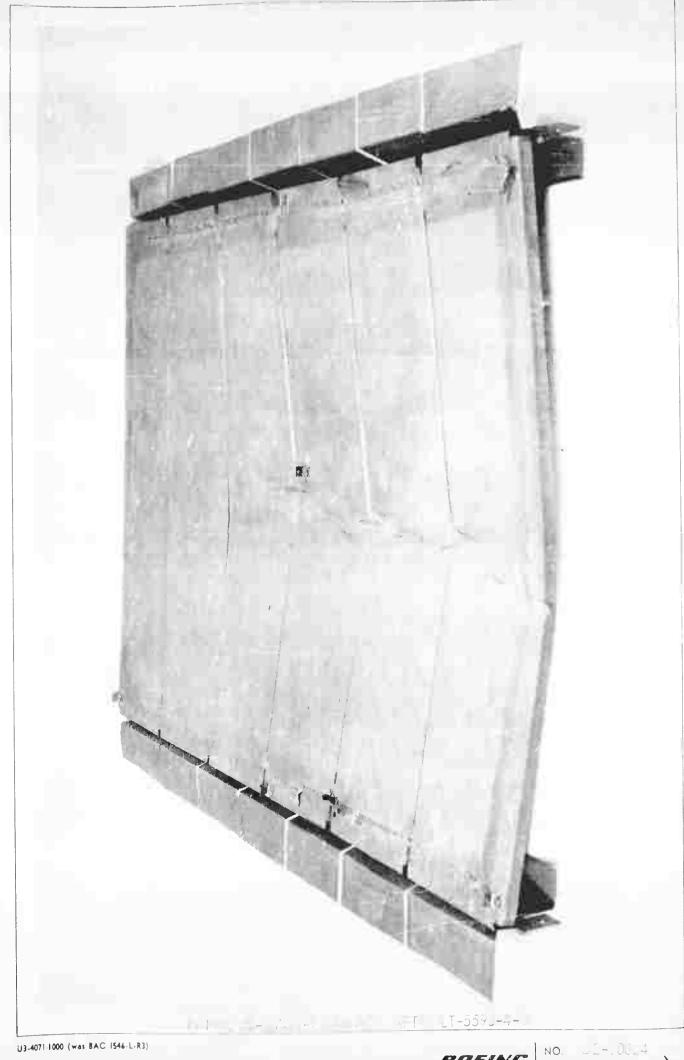




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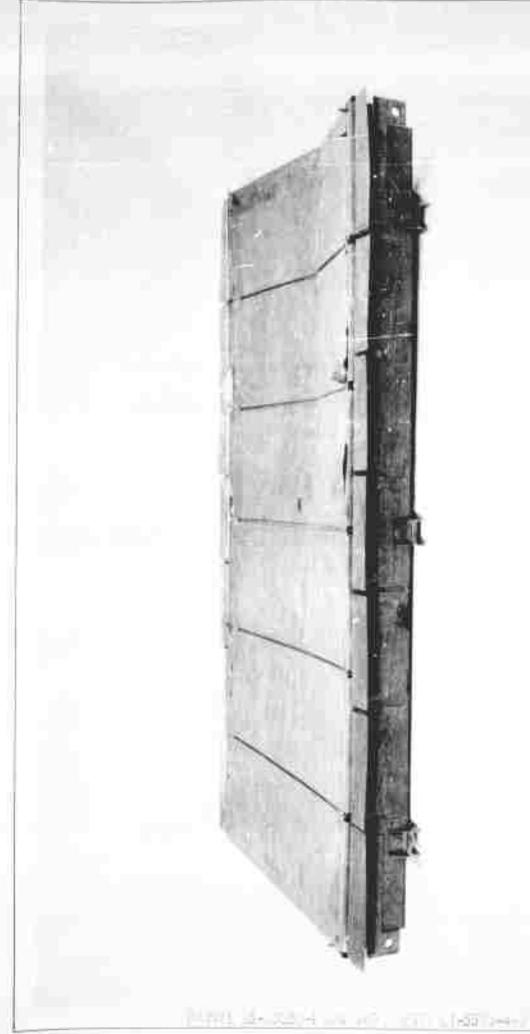
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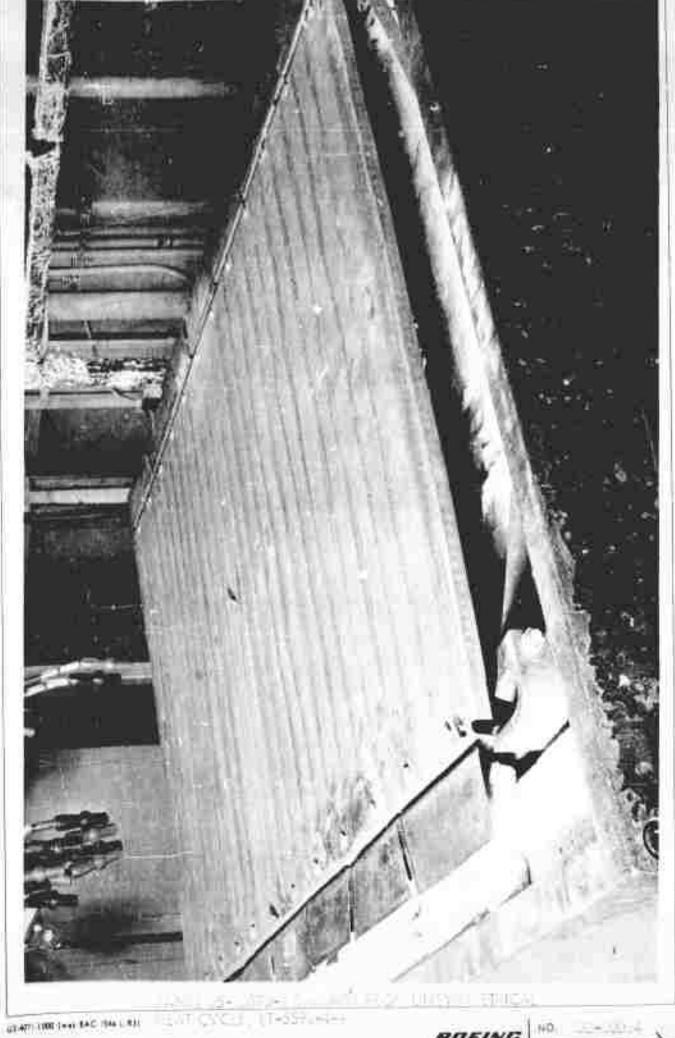


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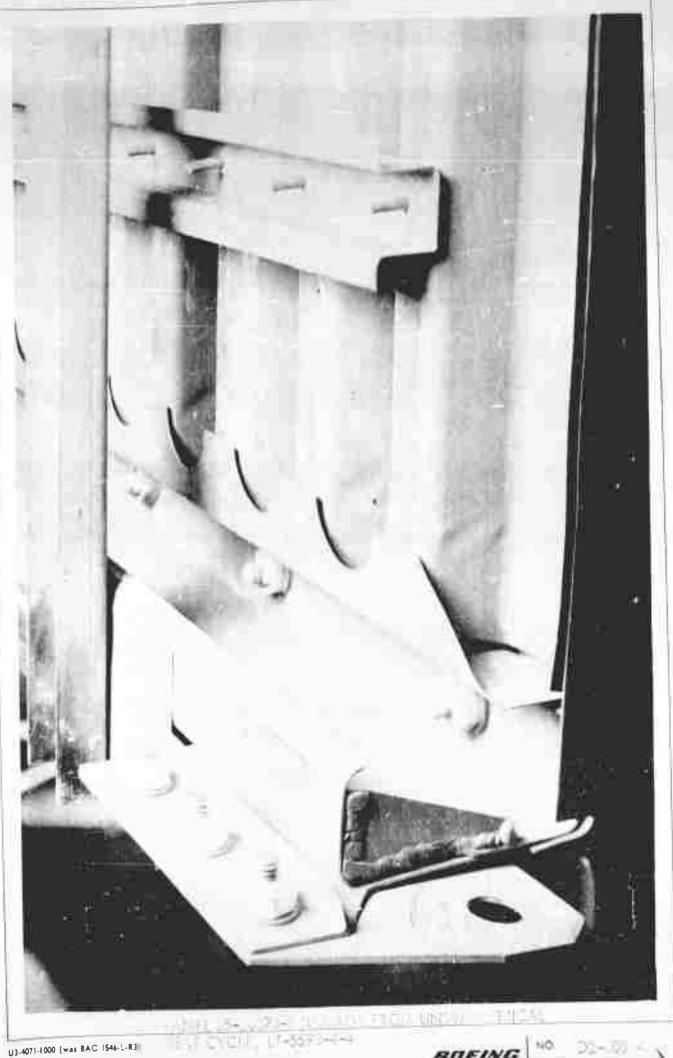
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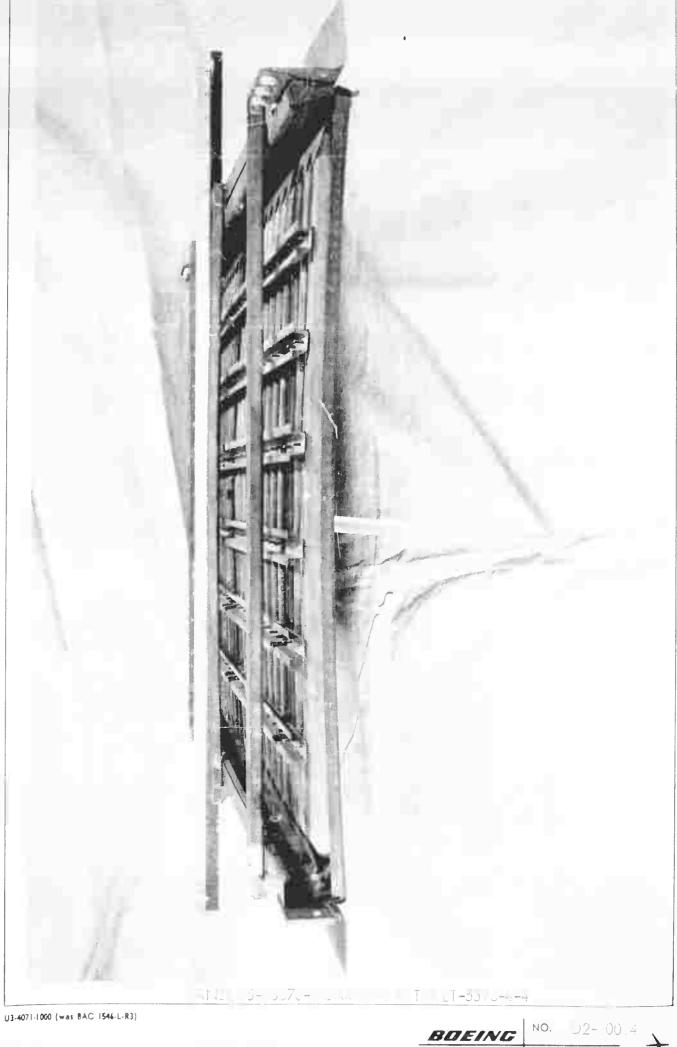


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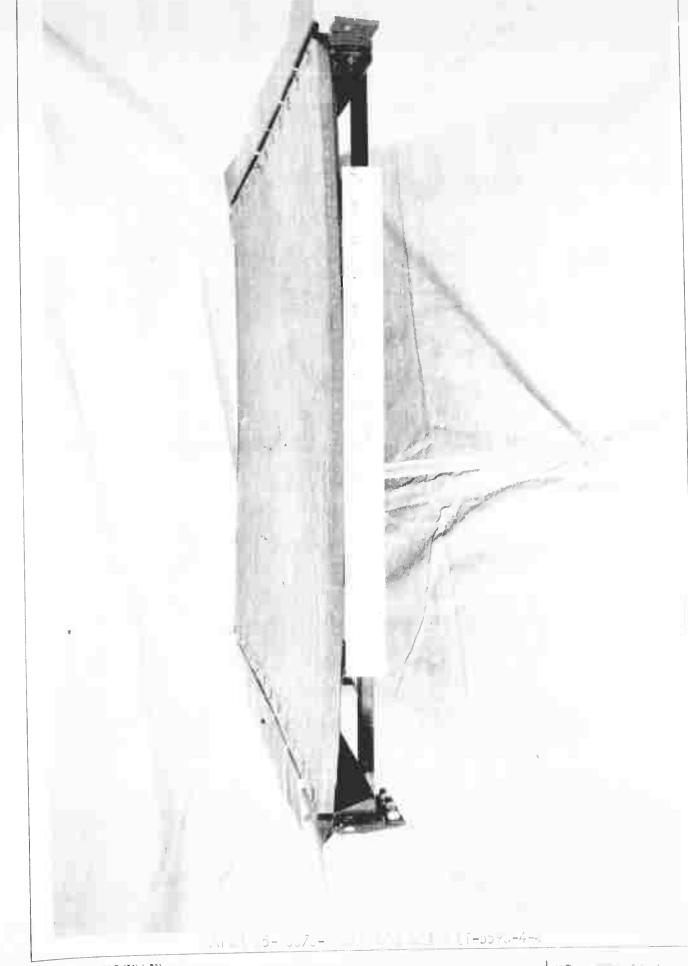


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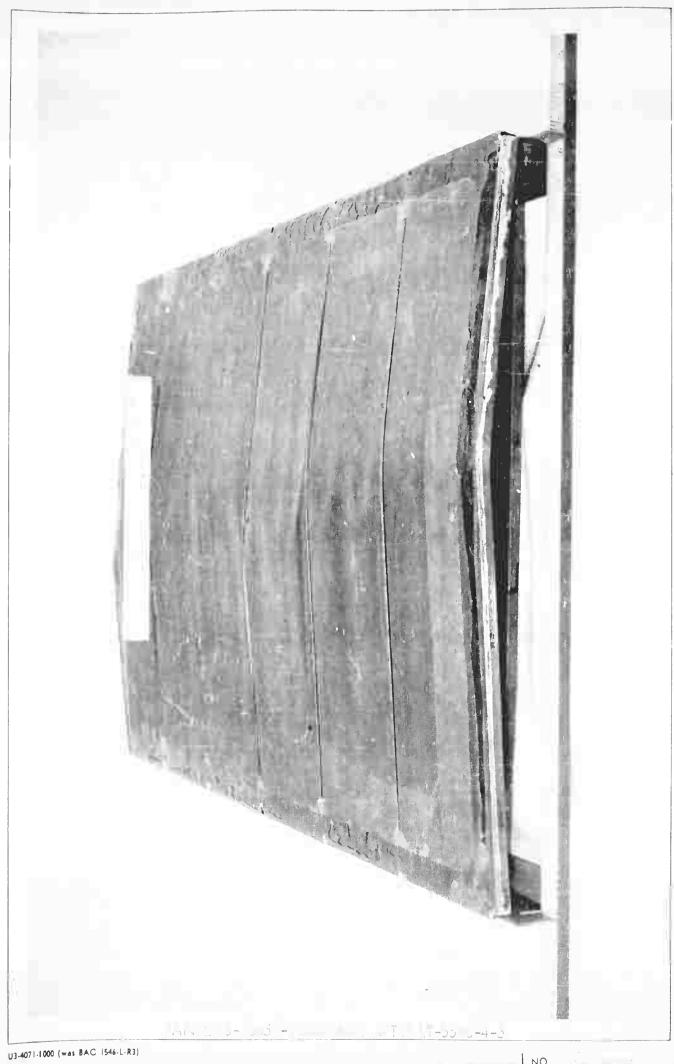
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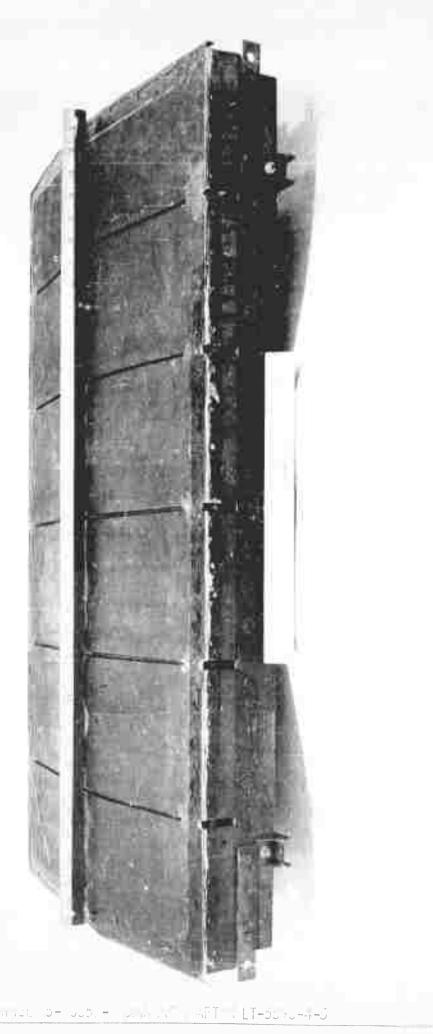
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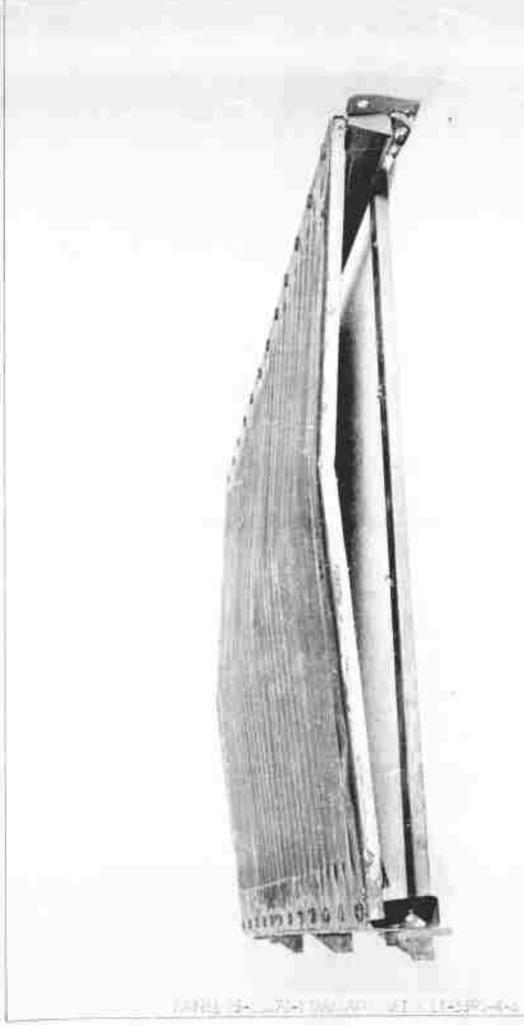


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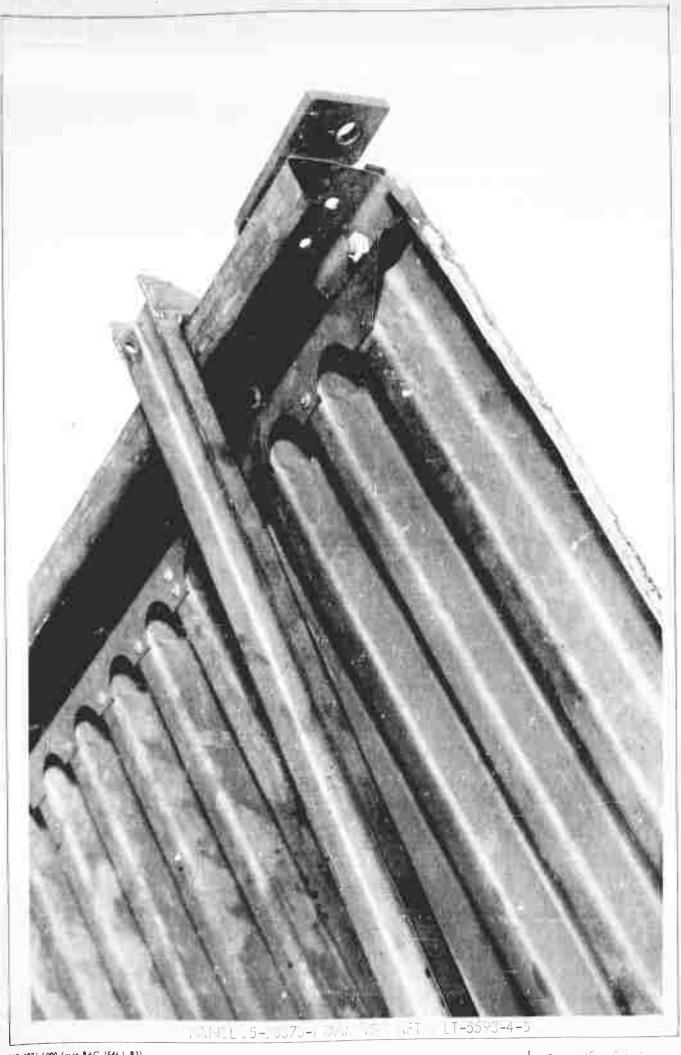
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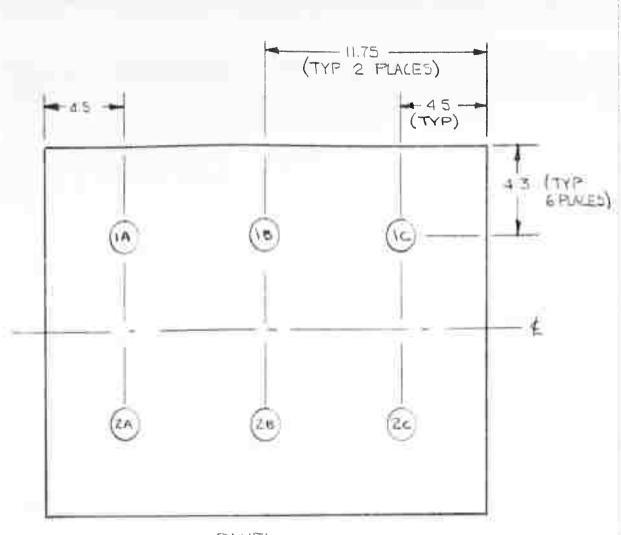




PAGE FIC. 30

VOLI PAGE

PAGE FIG. J4



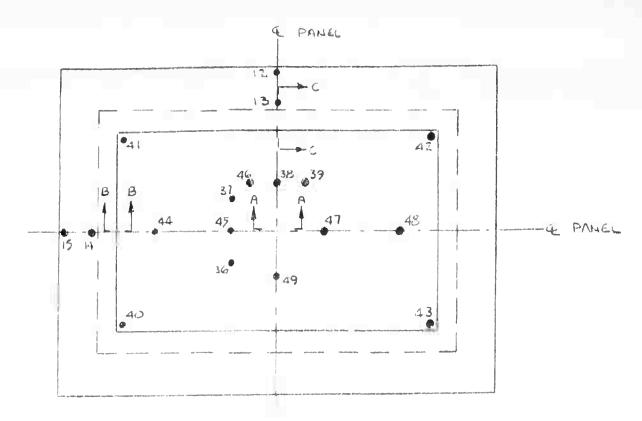
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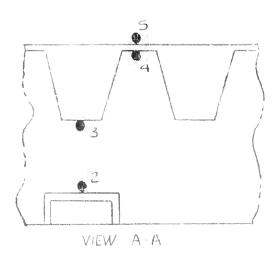
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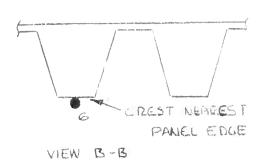
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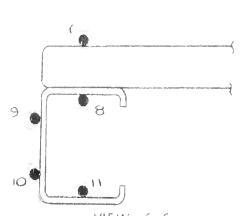
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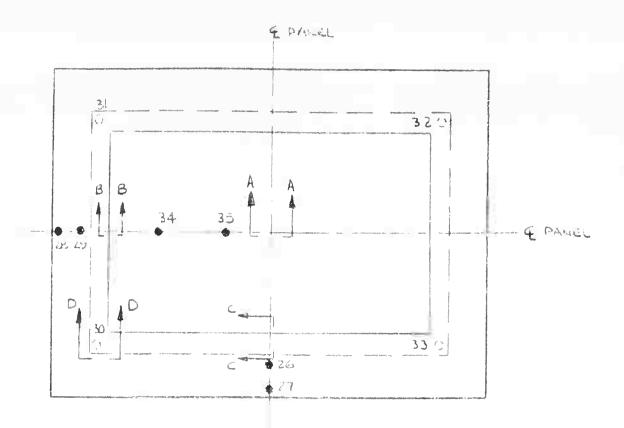
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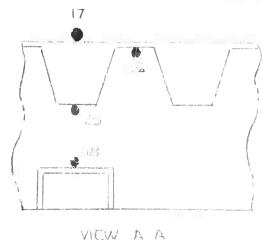
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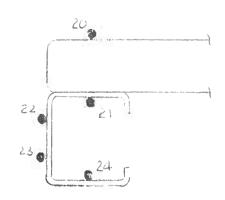


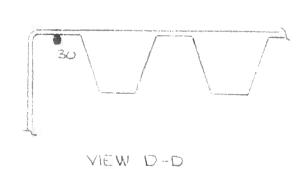
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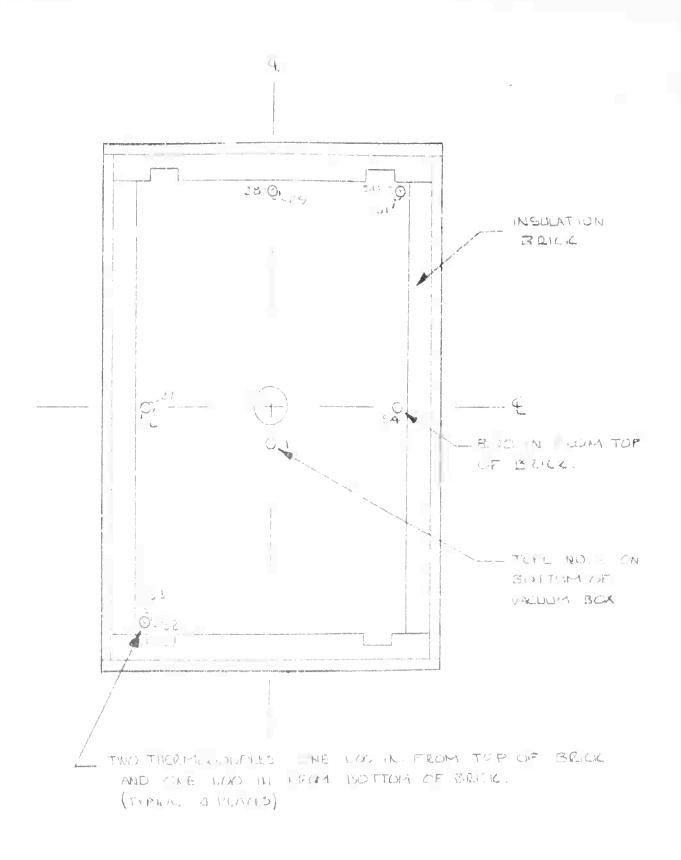
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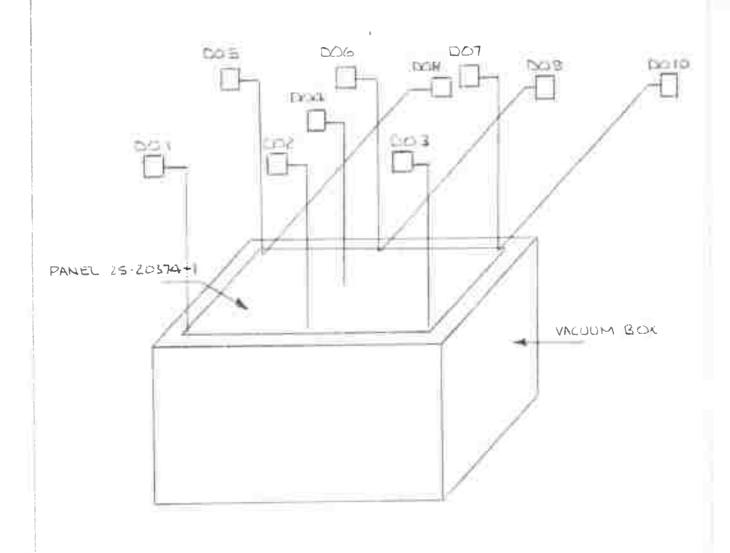
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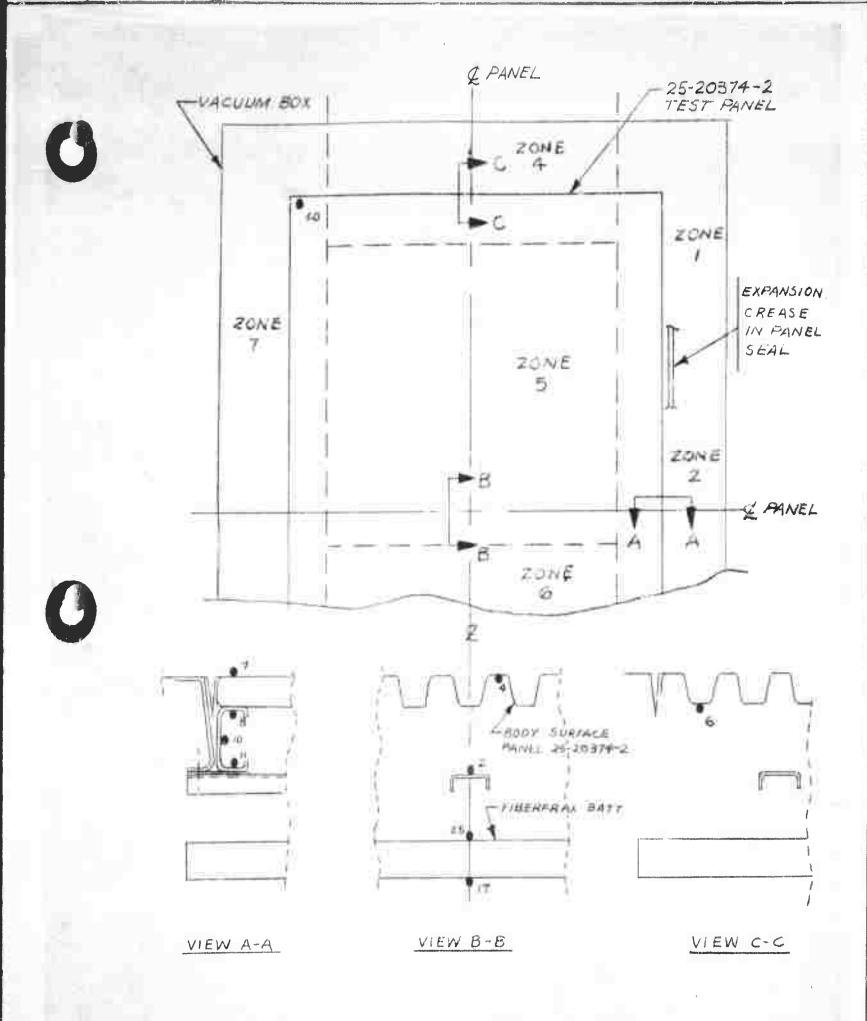
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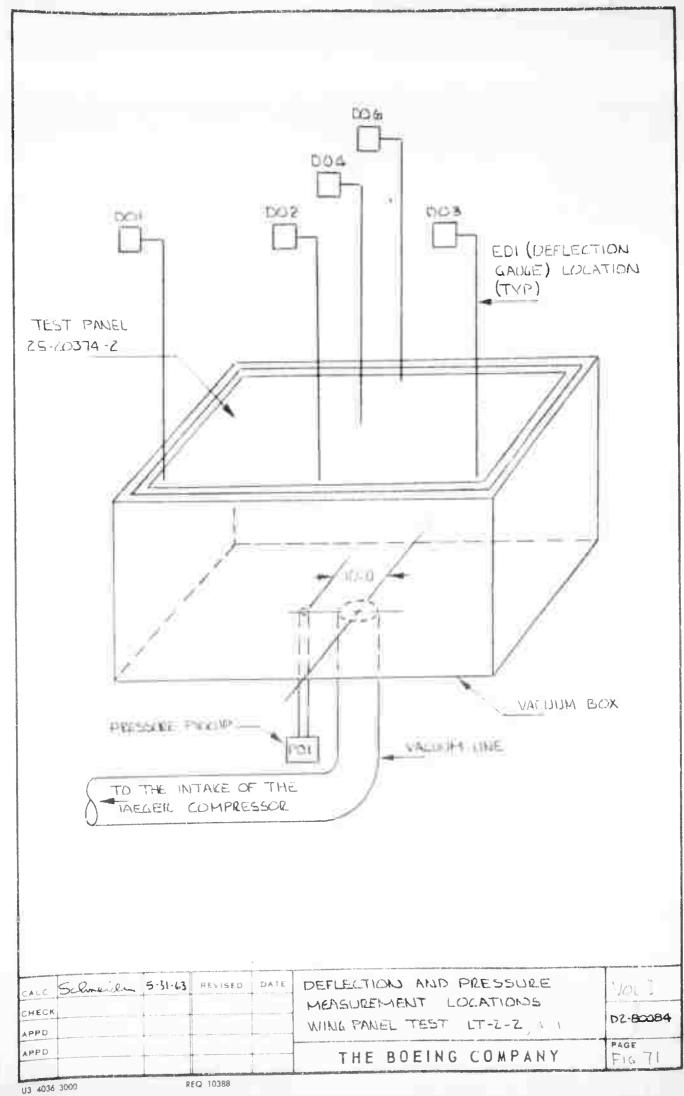


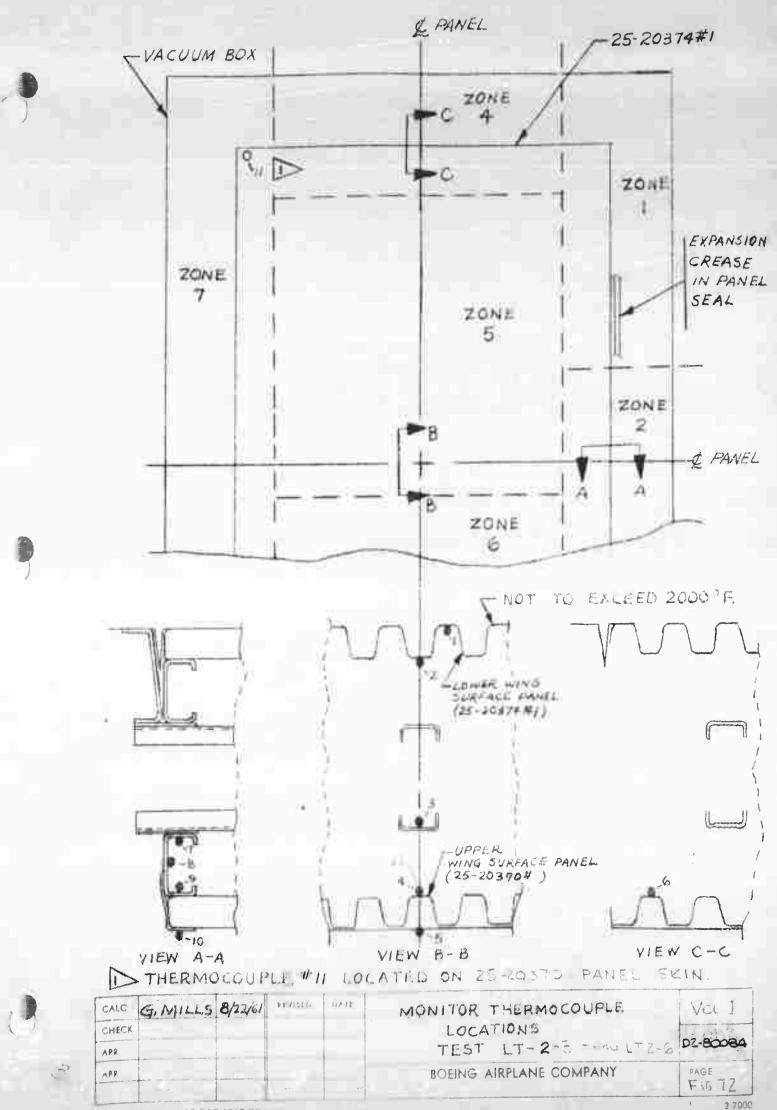
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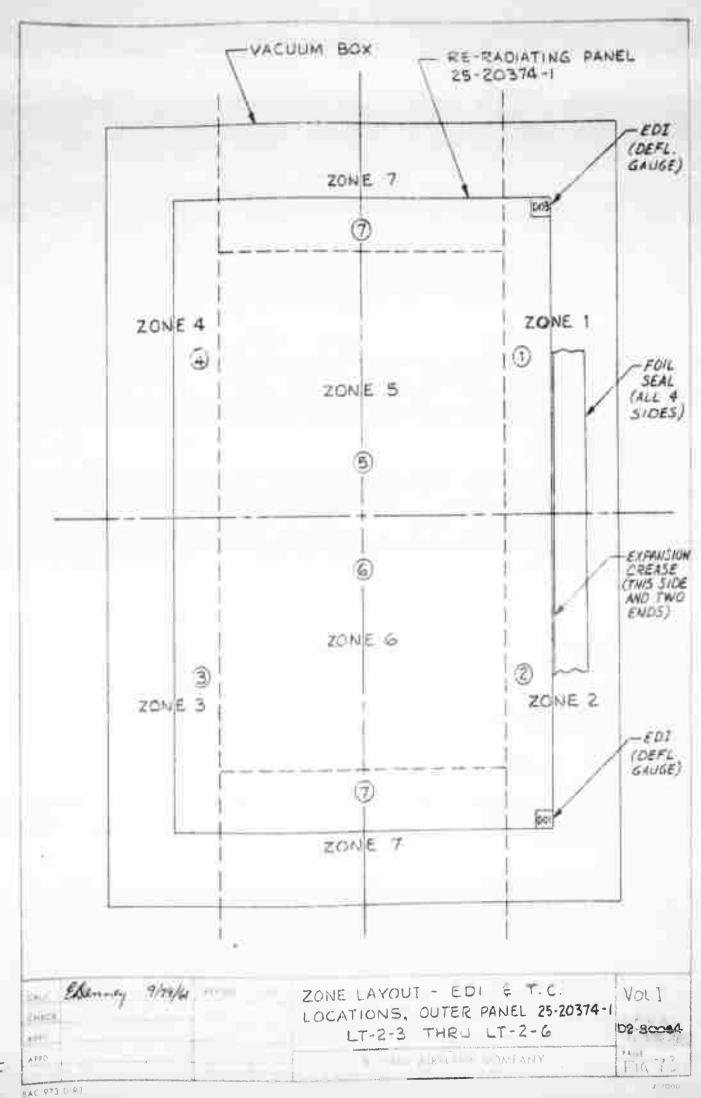
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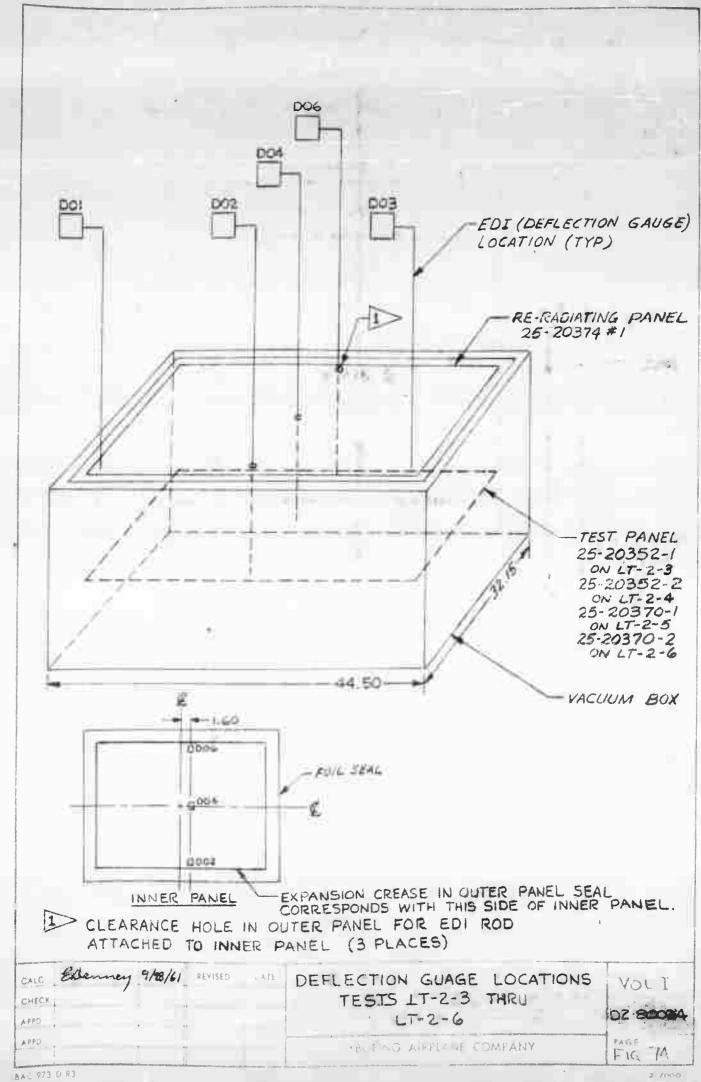
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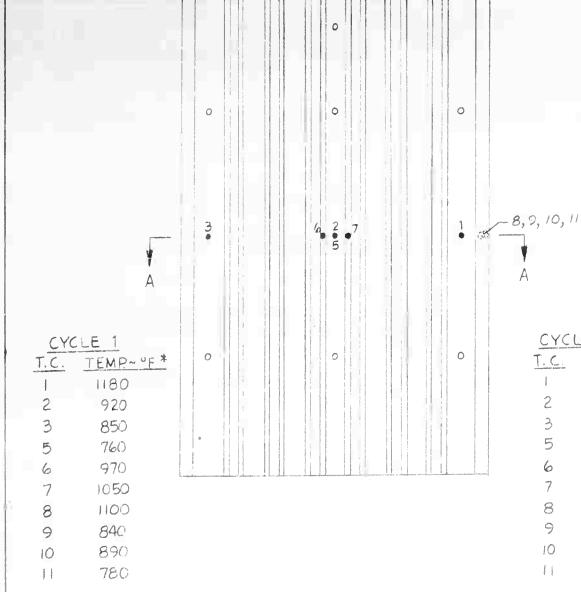




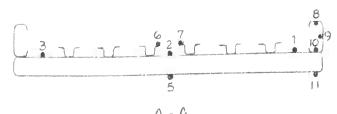
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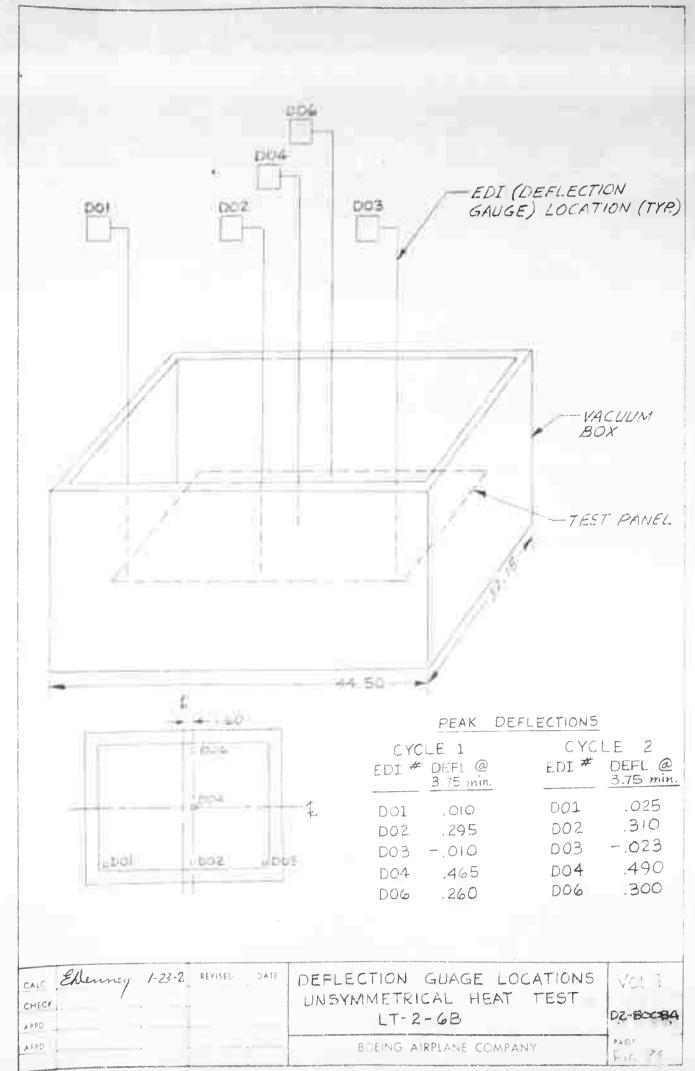
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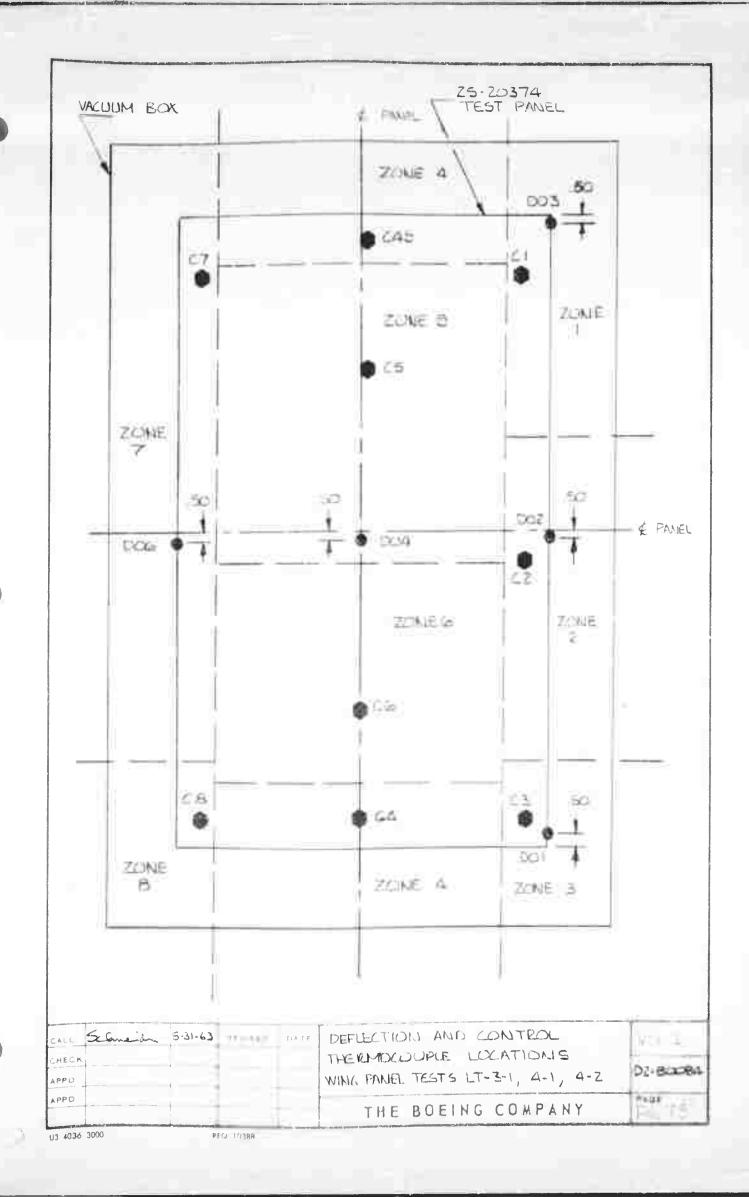
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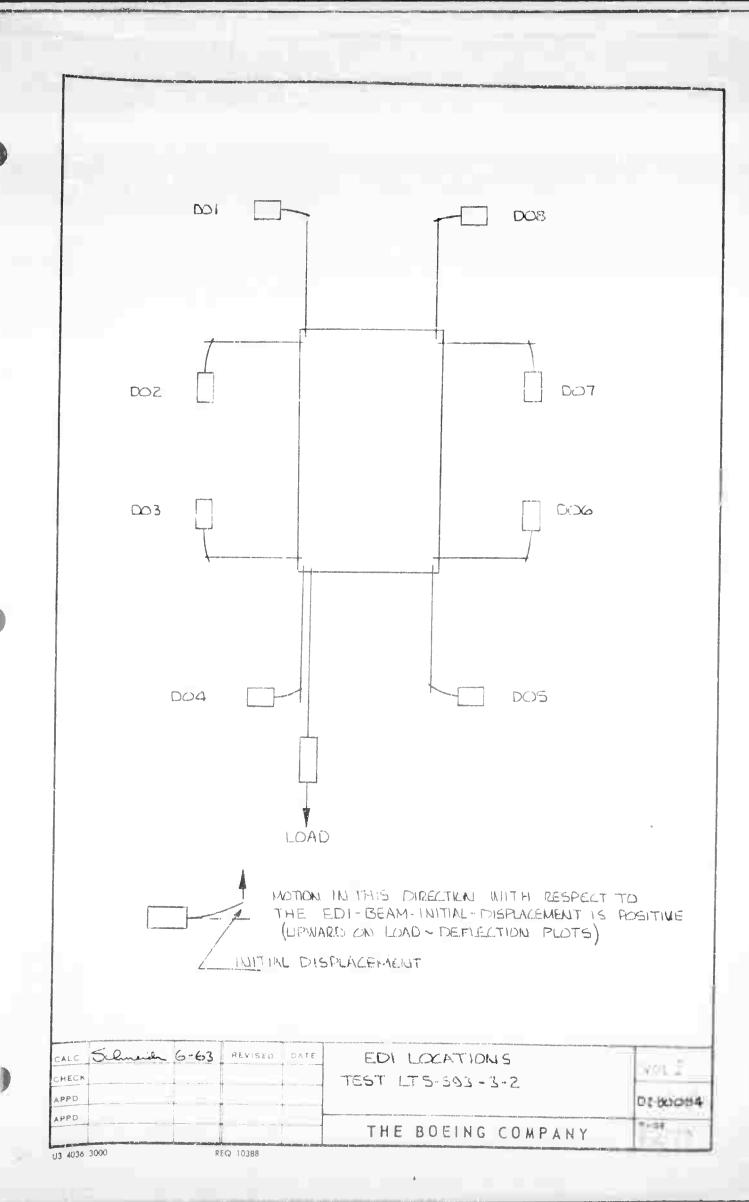


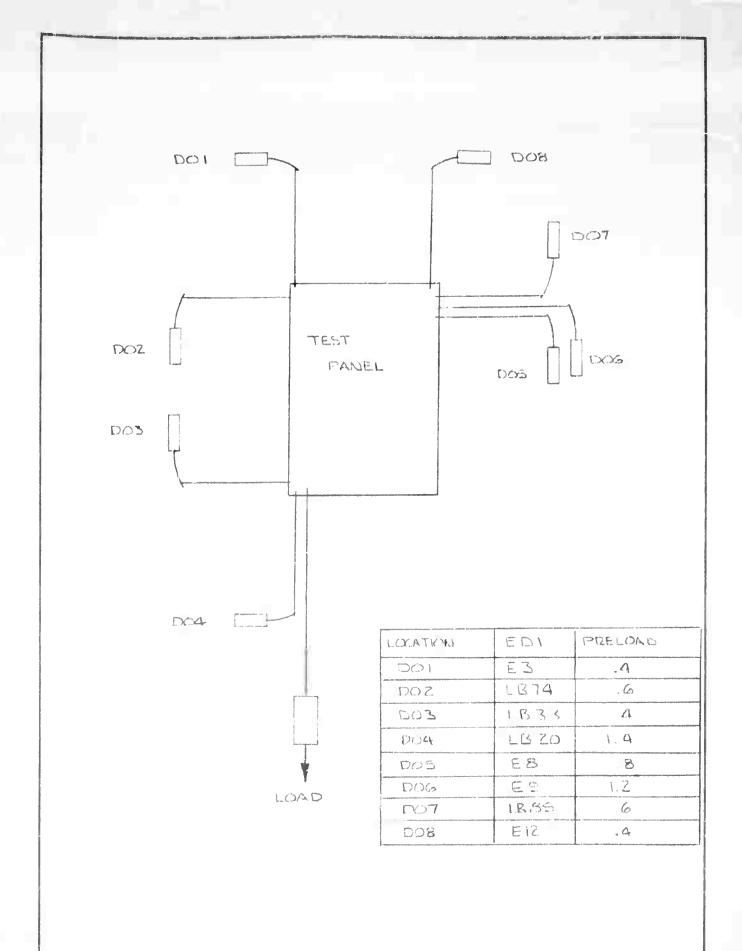
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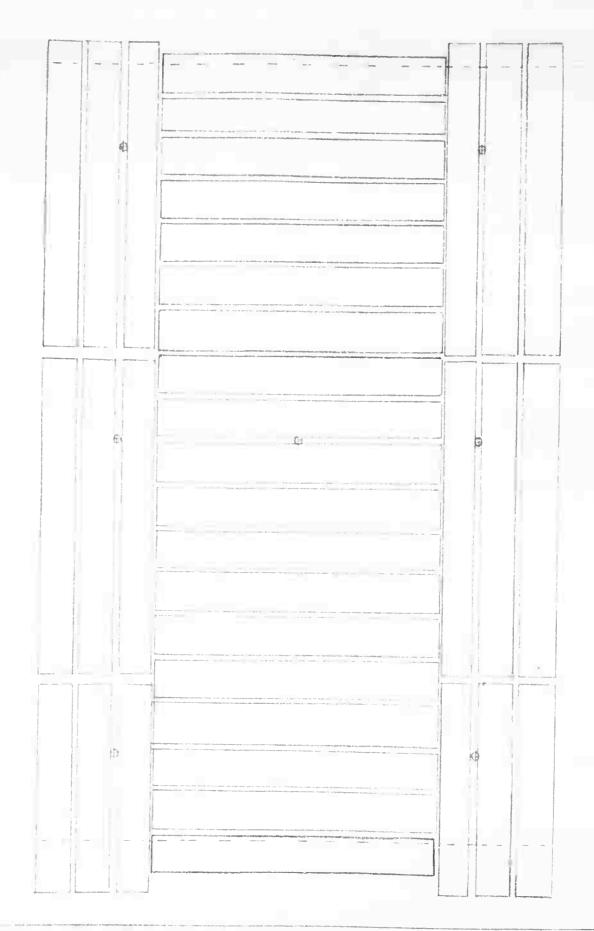




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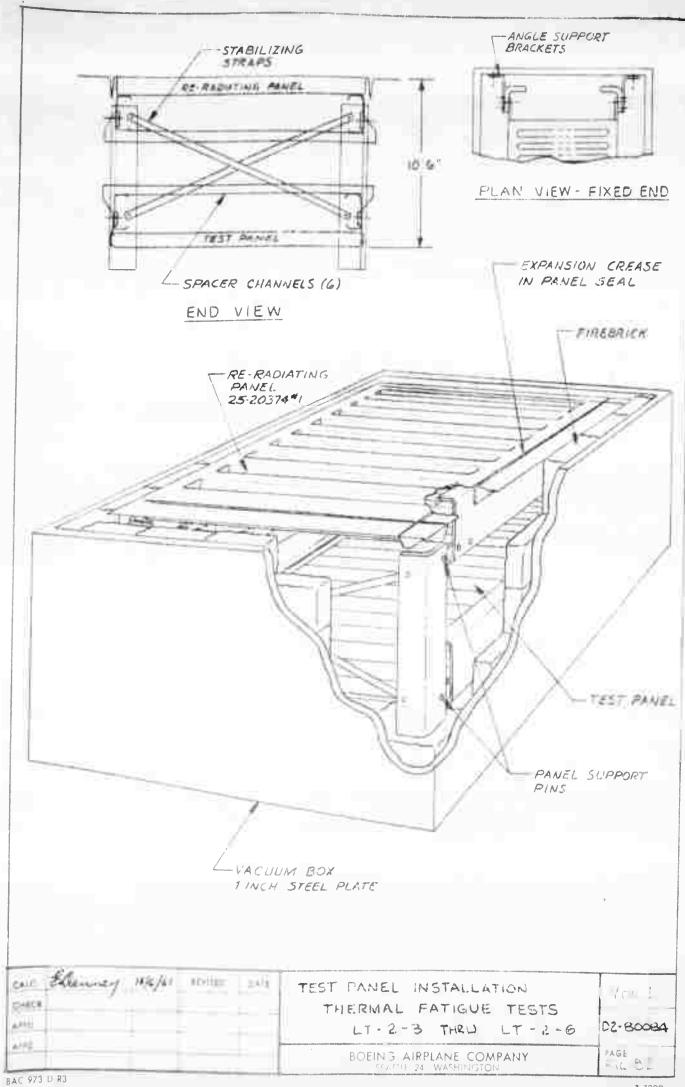
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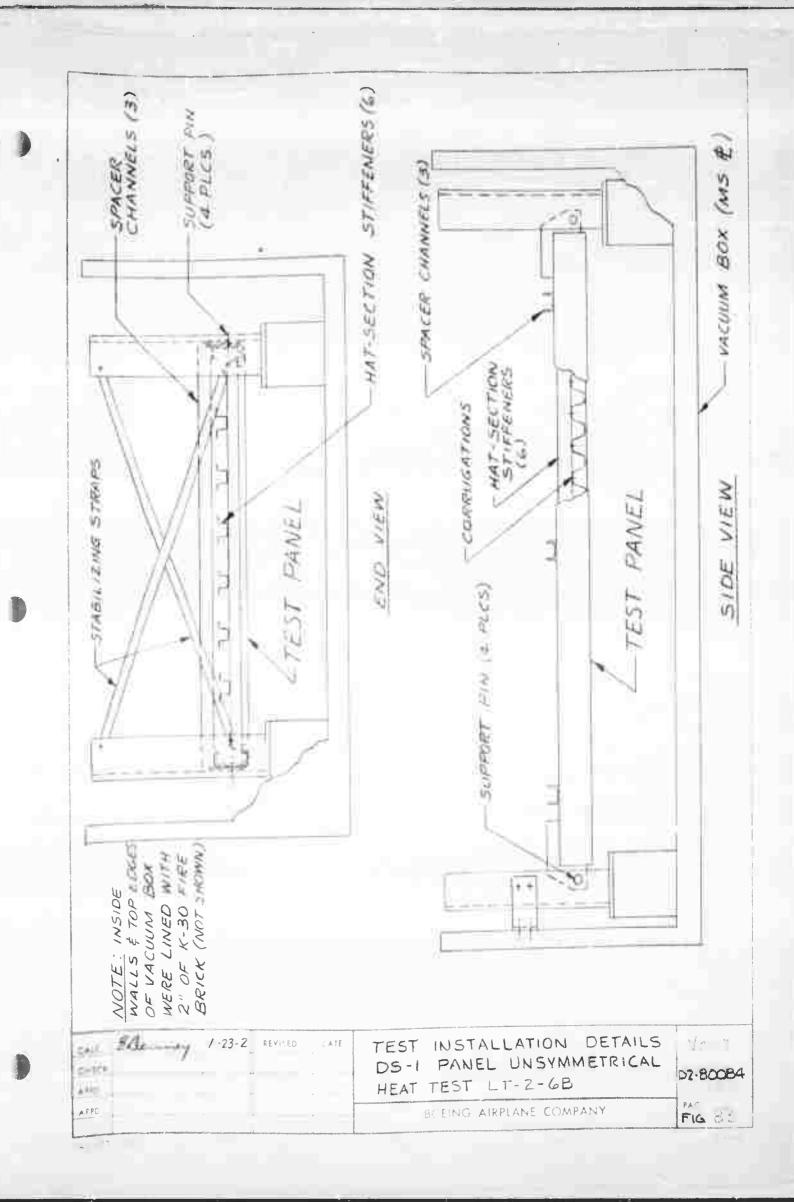
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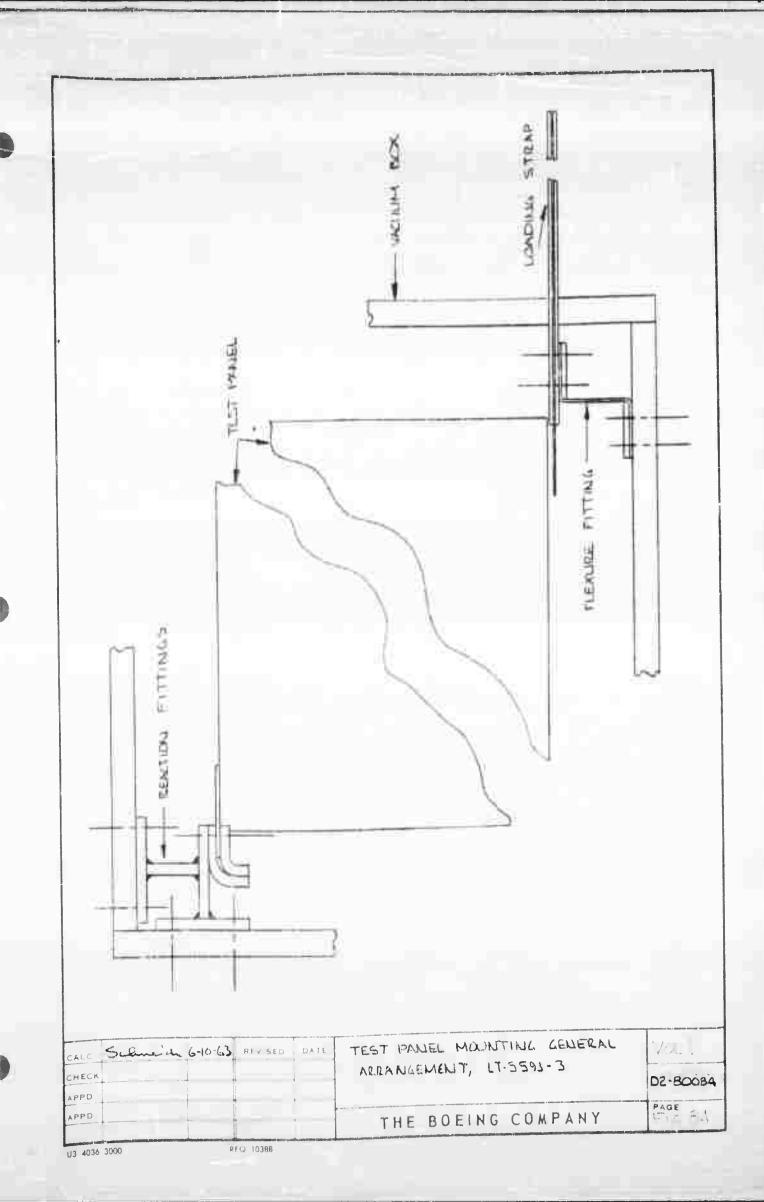
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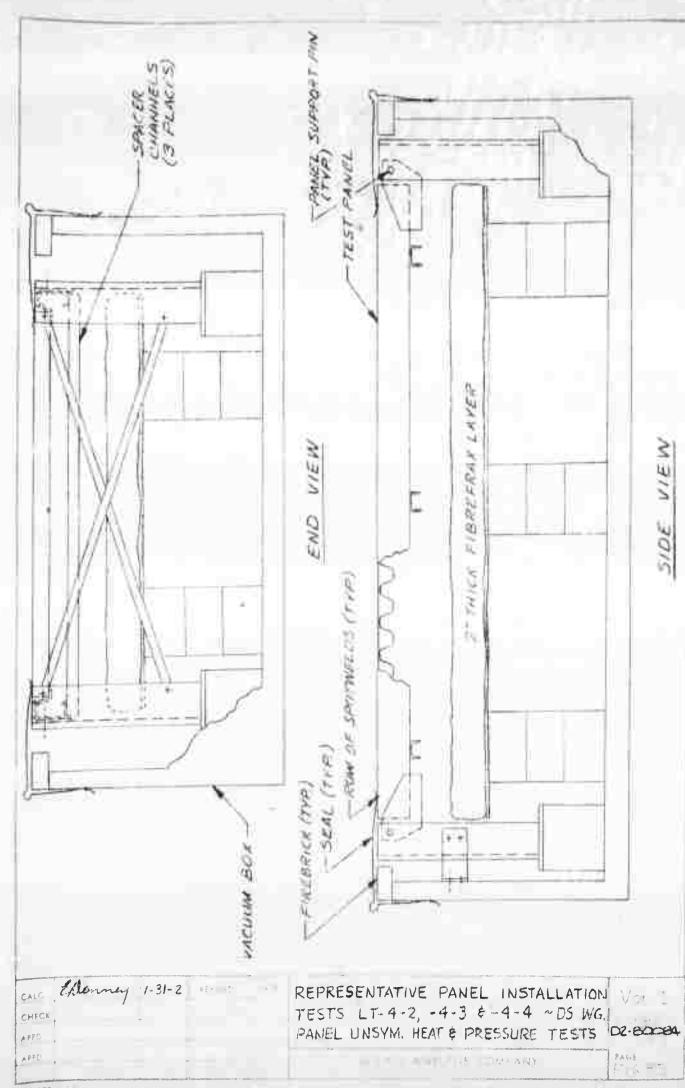
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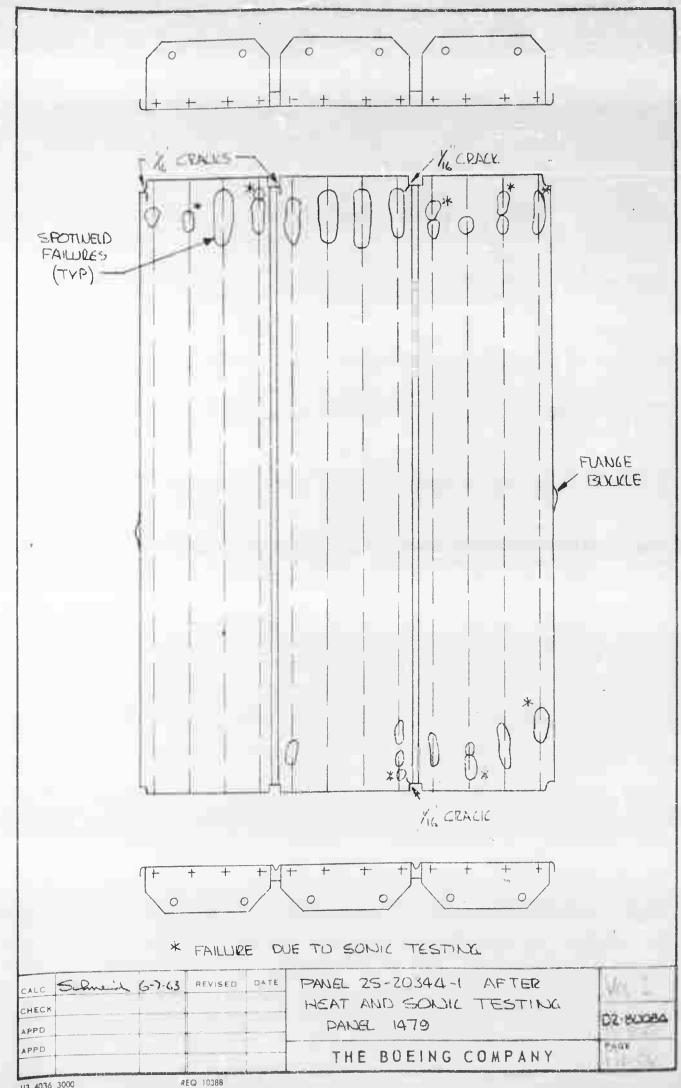




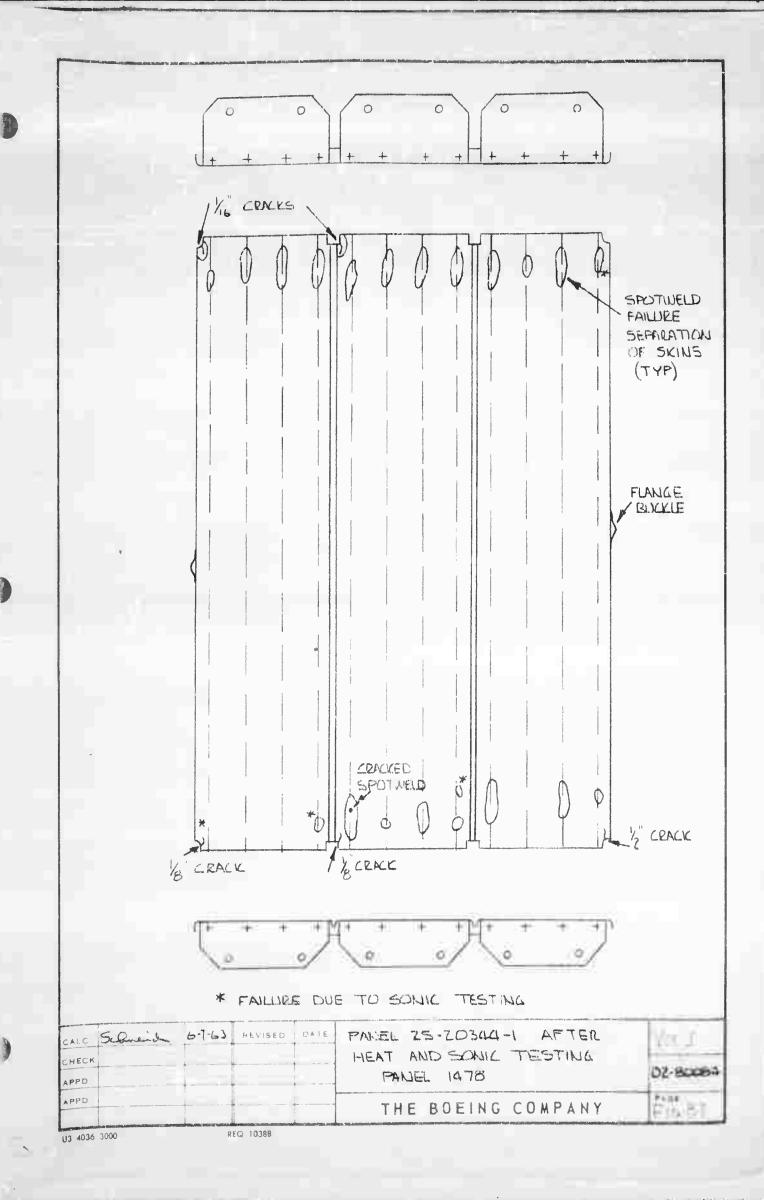


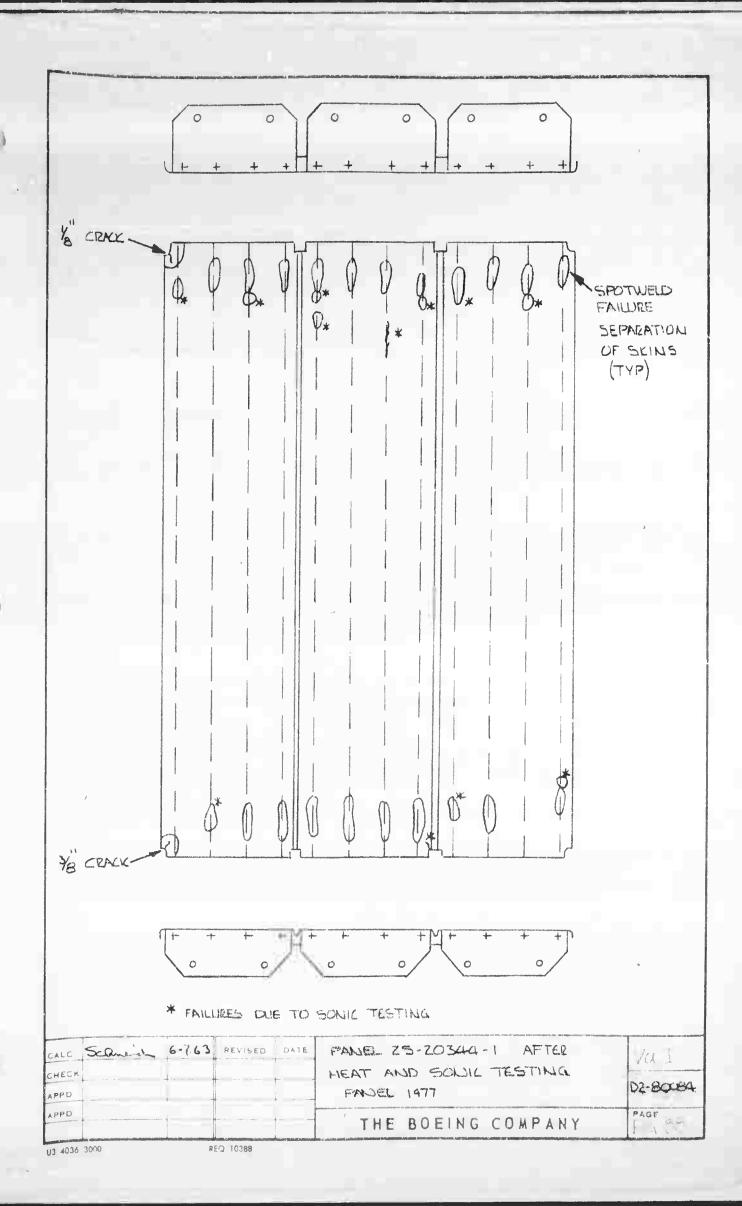


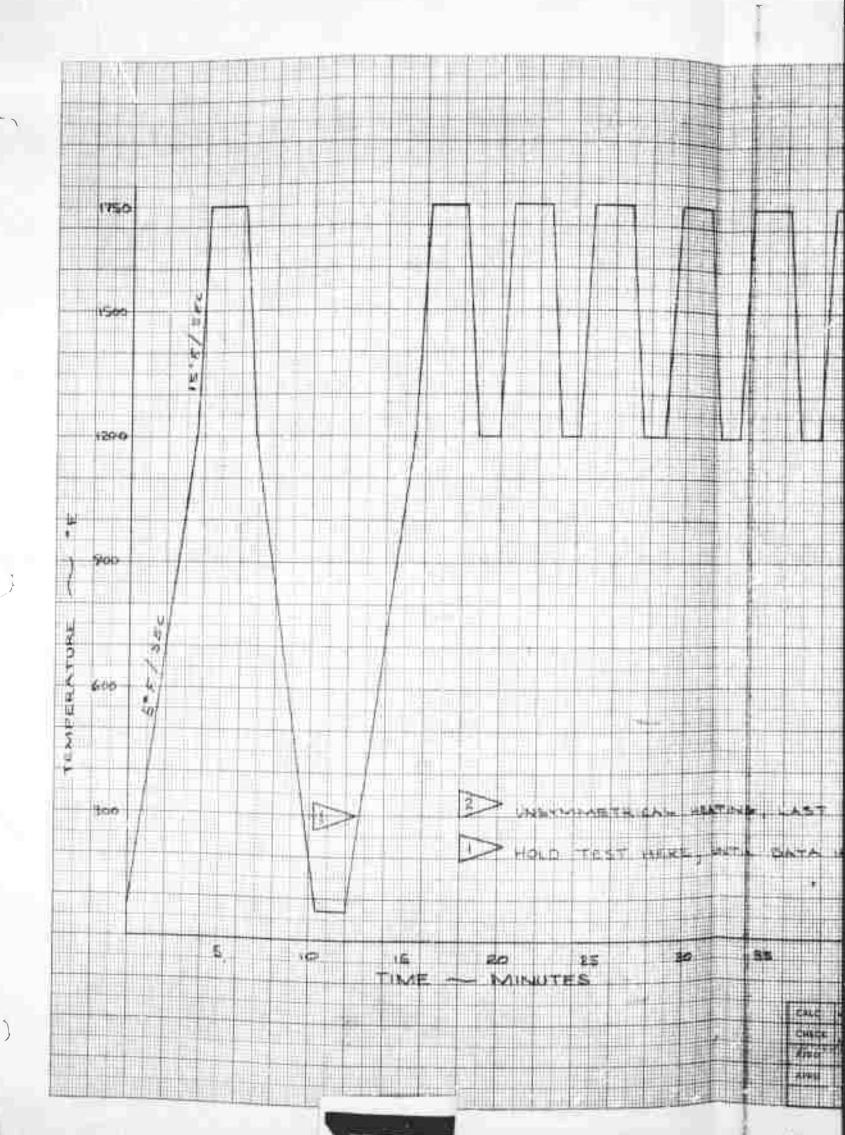
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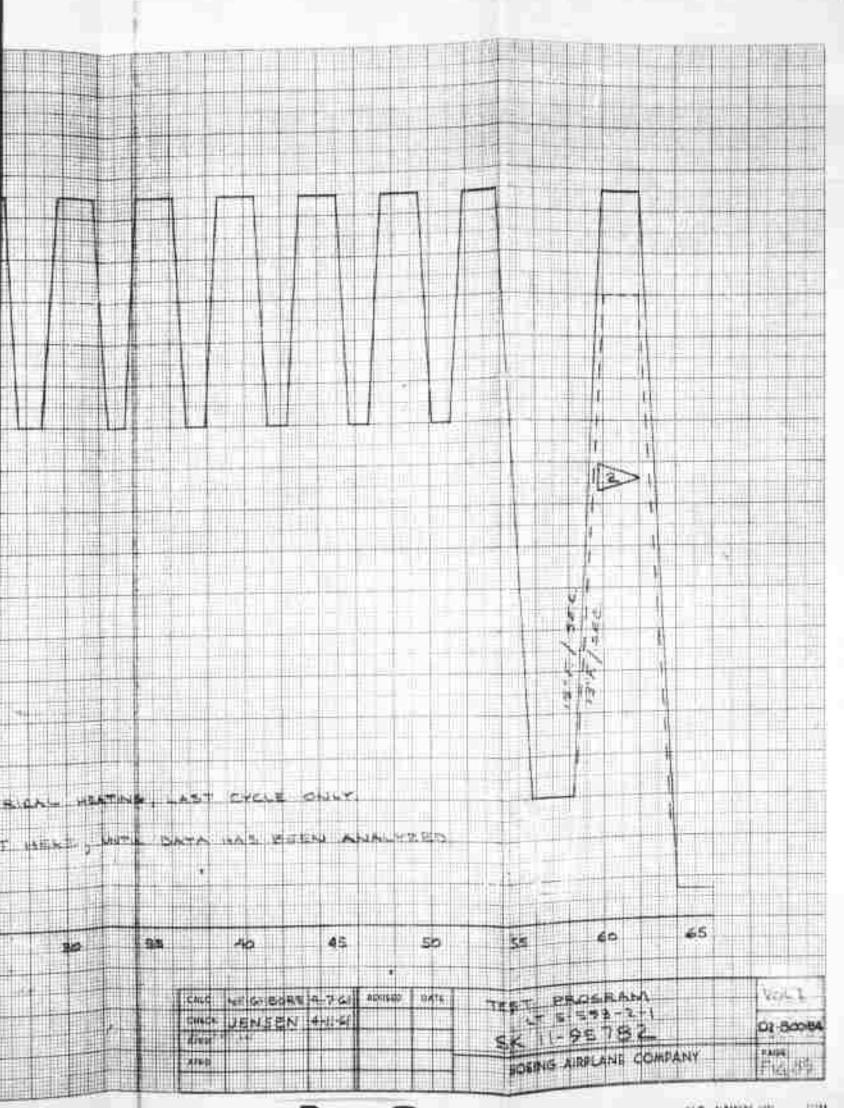
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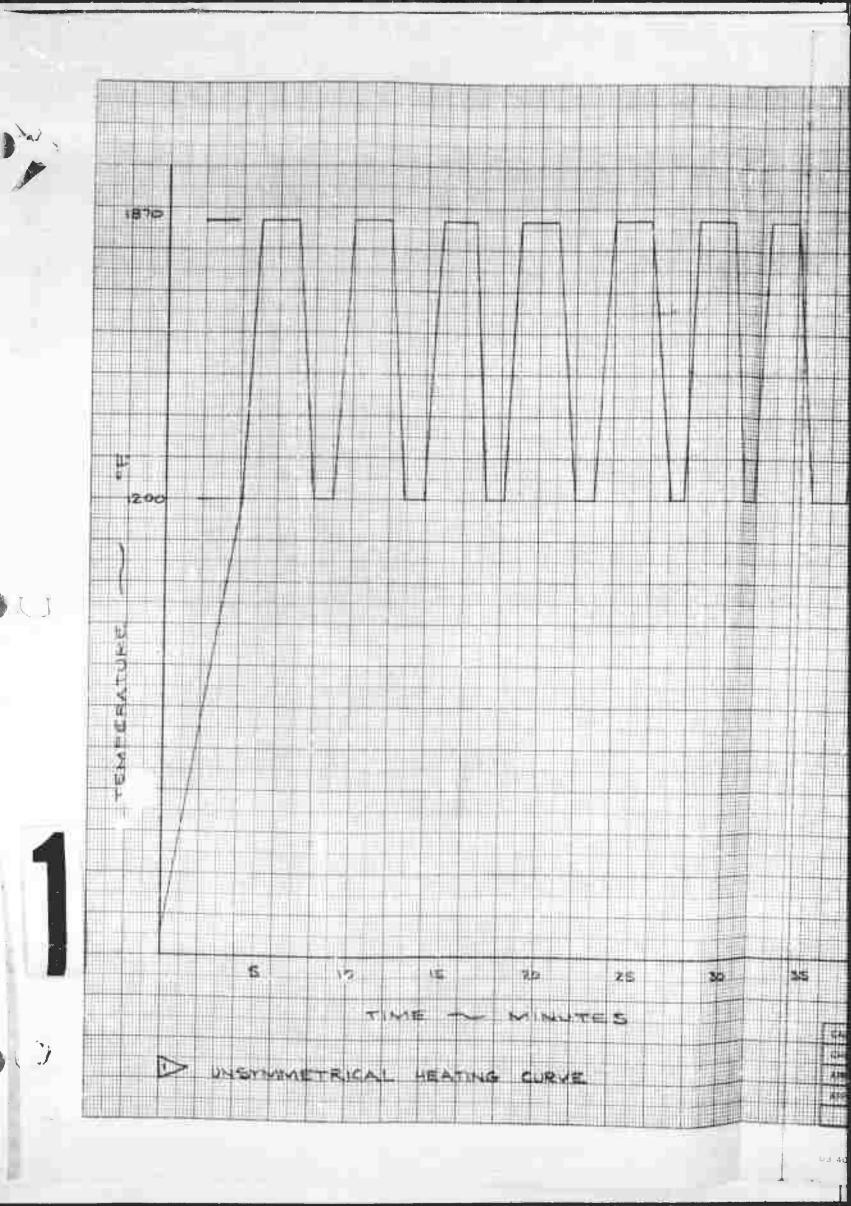


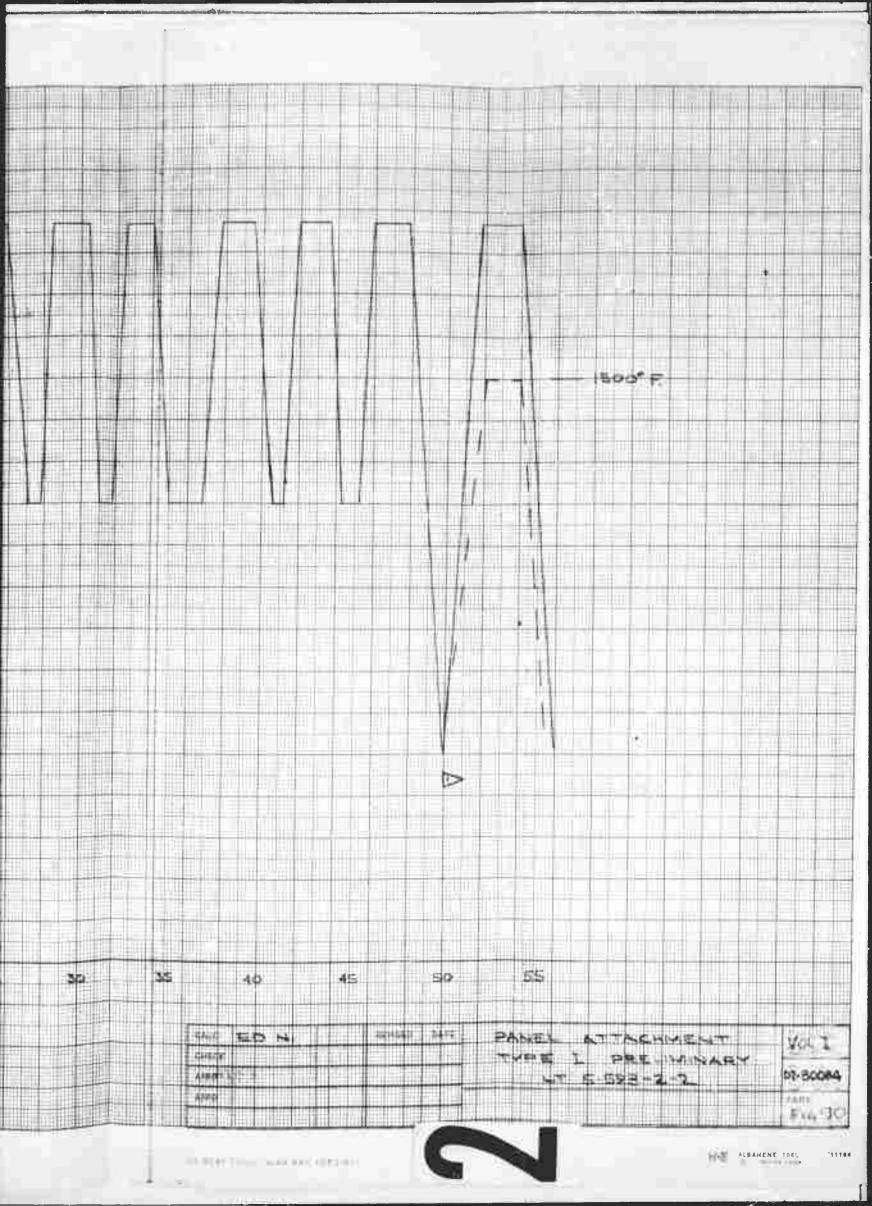
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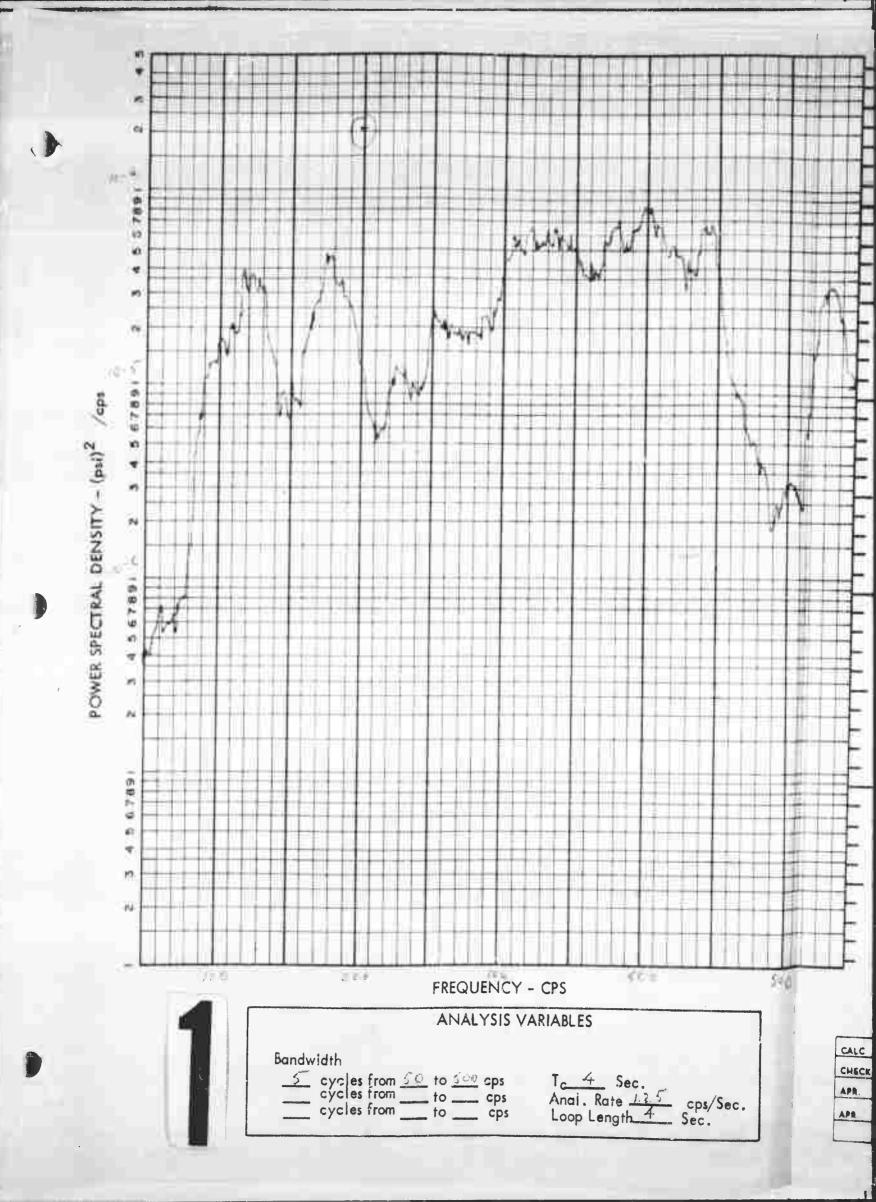
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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

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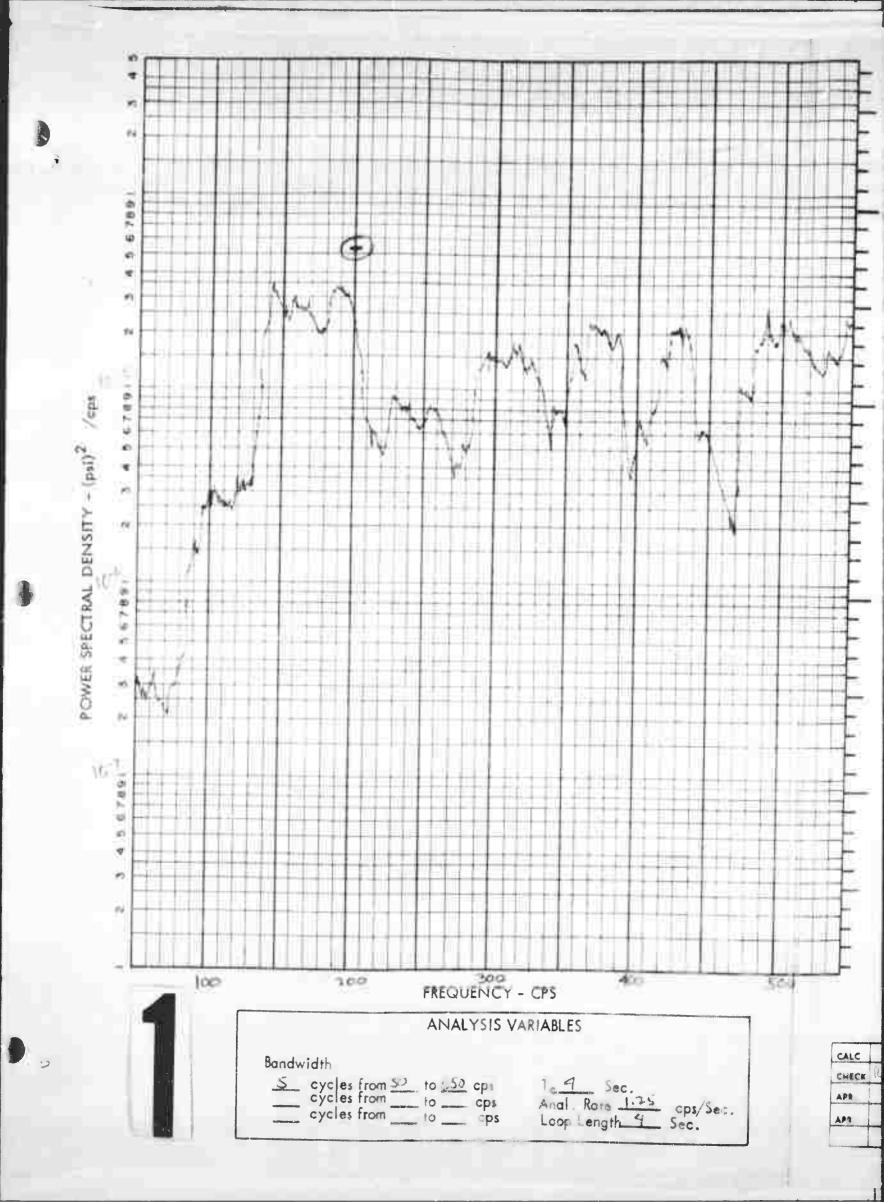
DATA IDENTIFICATION

EWA No. 5 5 4 3		Panel or Specimen No.			
Tape No.	Tape Chan	nel	Mic. No.		
Elapsed Test Time		Mic. RA	AS Level at Sonic Lab. Volts		

CALIBRATION

	CALIBR	AHON		
Tape No.	Tape Char	nel	Data Tape RMS	Volt
			VR = 5	155
Calibration Voltage			. 7	
Va = V _{rms} into Line	Amp.; V _c	=	ms on lape	cps
Line Amplifier Settin For Calibration G	= ();			
Lab. Gain LG =	Tape Mon	itor Gain .	$IMG = \frac{G_d}{G_c} =$	
Microphone Sensitivi	ty			
S = psi/Vo				
Equivalent of Calibra Pc = V S	ition - psi = 355	6.2	= 0.05	
Equivalent of Calibra $\left(\frac{P_c}{(TMG)(LG)}\right)^2$				psl ² /cps
Analyzer Attenuator	Setting db	Log	Converter Settin	9
Calibration Plotted a	† d.	w 4)		ps1 ² /cps
Overall Pressure Levi	el Data_		quiv. to 733	db SPL
RiviS pressure Level	(P_c)	(YR)	7.17	
	(TMG)	$LG)(V_c)$	3	
Sprint Sprint			grup unde	
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CALC	7 1	Coffee &	REVISED	DATE	DOWER TRAL DENIGITY ANIALYCIC	VOLI
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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

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DATA IDENTIFICATION

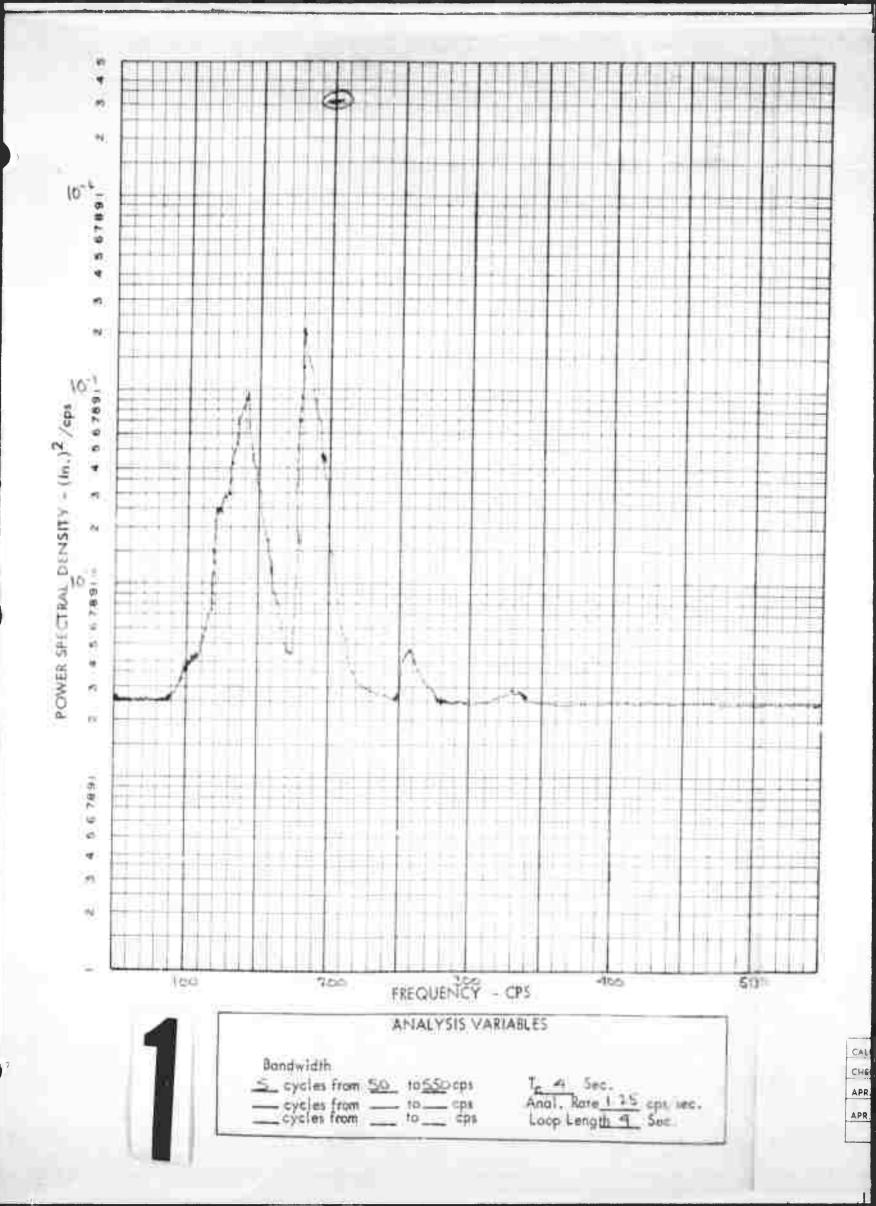
FALLEL ATTACH	TYPE I PRE	or Specimen No.
5503-1		1477
Tape No.	Tape Channel	Mic. No.
Elapsed Test Time	Mic. R	MS Level at Sonic Lab. Volts

CALIBRATION

	CALIBR	411014				
Tape No.	Tape Chan	nel	Data Tape RM	S Volt		
11			VR = .3	50		
Calibration Voltage			(an Tana ®			
$V_{a} = V_{rms}$ into Line	Amp.; V _c	= , 5	ms on Tape o	200 cps		
Line Amplifier Settin For Calibration G	gs = \ \ ;	for Data G	d = 12			
Lab. Gain LG =	Tape Mon	itor Gain ₁	$IMG = \frac{G_d}{G_c} =$	<i>}</i>		
	Microphone Sensitivity					
S = 140 psi/Vol	t or 1 Volt	ms = ((,	db SPL			
Equivalent of Calibra $P_c = V \cdot S$	tion - psi = S		145			
Equivalent of Calibro $\left(\frac{P_c}{(TMG) (LG)}\right)^2$		45	5, 26 × 10-3	pst ² /cps		
Analyzer Attenuator	Setting db	Log	Converter Setti	ng		
Calibration Plotted a	t 5 1 % la	4 10-5		ps1 ² /cps		
Overall Pressure Level	(P _c)	(V _{R)} E	quiv. to	db SPL		
75 Ann- Op ins.	(,,,,,)	/\ 'C/	operate of vices			
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CALC	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	V/21 T
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APR			THE BOEING COMPANY	PAGE

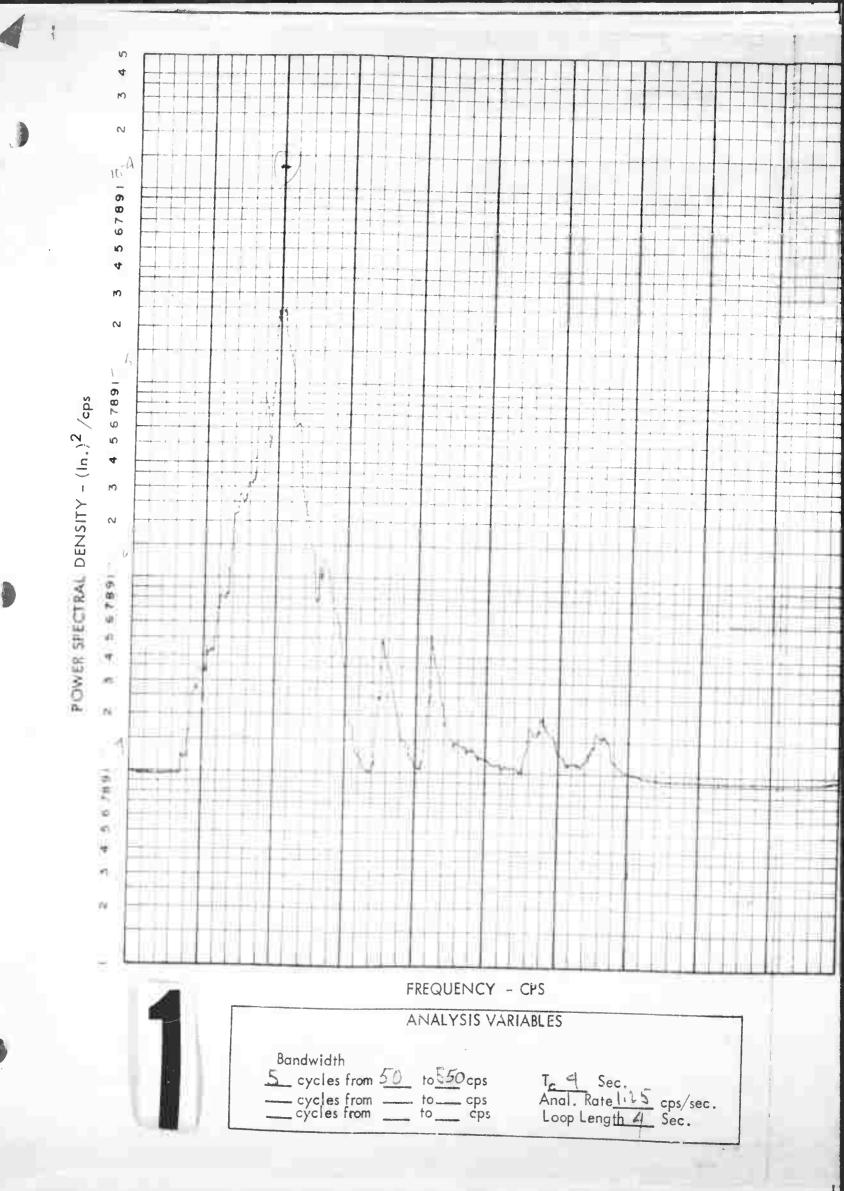




Test Title PANEL ATTACK EWA No. 550			SLIM Specimen No.
Tape No.	Tape Char	nnel	Displacement Pickup
Elapsed Test Time		P/U RMS I	Level at Sonic Lab. Volts

	CAL	IBRATION		
Tape No.	Tape Char		Data Tape R	MS Volt
11	1		V _R =	2.75
Calibration Voltage		V	- \/	_
$V_{a} = V_{mns}$	into Line A	mr.; V =	. 5 mms o	n lapezoocps
Line Amplifier Setti	195		G	
For Calibration	c = .1	; for Date	a 09 = .	_
Lab. Gain LG =	Tape Mon	tor Gain 7	$MG = \frac{G_d}{G_c} =$	2
Displacement Pickup				
S = .0708 in./		,		
Equivalent of Calibr	ation - in.	Was de almonouries - Press de realite dudite-Mariedendustrille - co T _{th}	the control of the second section of the section of	
$D_c = V_a \cdot S =$	(0.5)	0.10%)	0.0354	
Equivalent of Calibr	ation for P	SD Plots		
$\left(\frac{D_c}{(TMG)(LG)}\right)^2$	0.0	54 1"	3.13 x 10	9 . 2/2
(TMG)(LG)	121			in. / cps
Analyzer Attenuator	Setting	Log Conv	erter Setting	
**************************************	db		db	
Calibration Plotted				. 2/
	X SI.S	10-6	- se	in. ² /cps
Overall Deflection				
RMS Defl. Level				
	(TMG)(LC	$\Theta(V_c)$		
nic.	pro-production to the state of	- Strangerer Stranger - Annahaman Stranger -		ps!

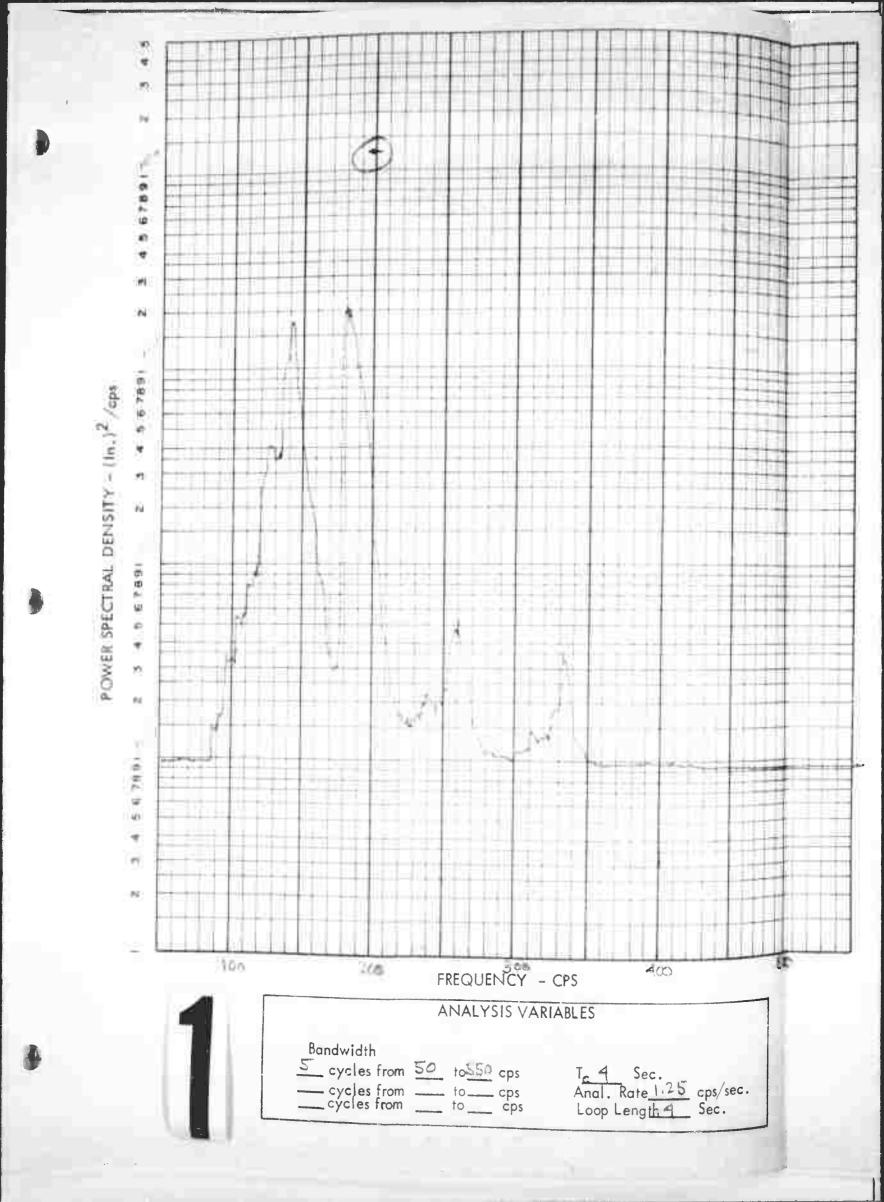
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CHECK **- >		1977 Plu No 1	172-9084
APR		THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 38



Test Title PANEL ATTA		and the second s
EWA No. 5593-1	Panel or	Specimen No.
Tape No.	Tape Channel	Displacement Pickup *
Elapsed Test Time	P/U RMS VL =	Level at Sonic Lab. Volts

CALIBRATION Data Tape RMS Volt Tape Channel Tape No. VR = 0.215 Calibration Voltage $V_{q} = \sqrt{5} V_{rms}$ into Line Amp.; $V_{c} = \sqrt{5} V_{rms}$ on Tape 2 cocps Line Amplifier Settings
For Calibration $G_c = 1$; for Data $G_d = 1$ Tape Monitor Gain TMG = Gd = Lab. Gain LG = Displacement Pickup Sensitivity S = .0708 in./Volt Equivalent of Calibration - in. Dc = Va · S = (.5)(.0708) ,0254 Equivalent of Calibration for PSD Plots D_c (TMG)(LG) Analyzer Attenuator Setting Log Converter Setting _/ ○ dk Calibration Plotted at in.²/cps Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(Vc) psi

CALC C	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS OF DISPLACEMENT PICKUP	VOLI
APR.			1417 F/U 110. 5	DZ-80084
APR.		, P	THE BOEING COMPANY SEATTLE 24, WASHINGTON	FIG 99



Test Title . PANEL ATTAC	H and both to	PRELIM
EWA No. 5593	Panel or S	pecimen No.
Tape No.	Tape Channel	Displacement Pickup
Elapsed Test Time	P/U RMS I	Level at Sonic Lab. Volts

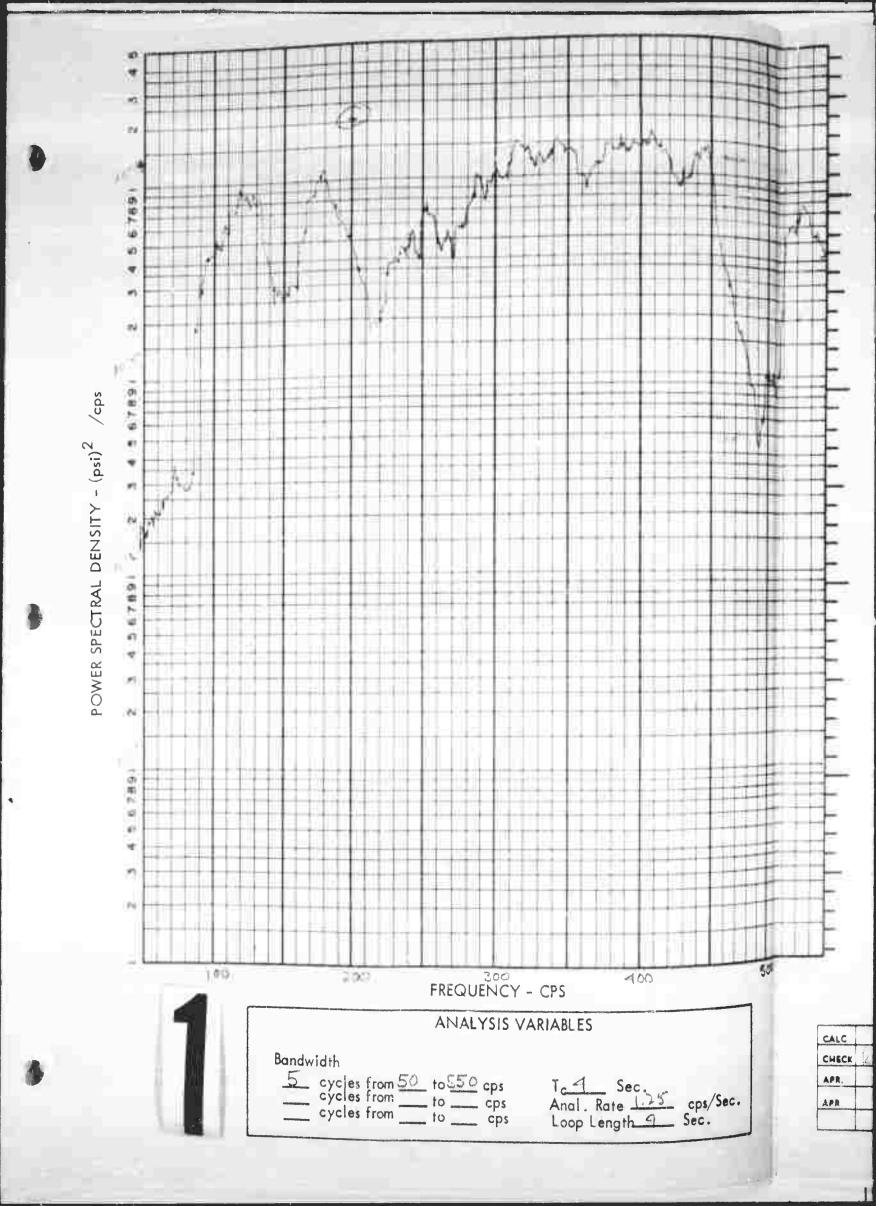
CALIBRATION Data Tape RMS Volt Tape No. Tape Channel VR = .745 Calibration Voltage $V_{a} = \sqrt{5}$ V_{rms} Into Line Amp.; $V_{c} = \sqrt{5}$ V_{rms} on Tape 200 cps Line Amplifier Settings
For Calibration $G_c = .$; for Data $G_d = .$ Tape Monitor Gain TMG = $\frac{G_d}{G_c}$ = Lab. Gain LG = Displacement Pickup Sensitivity S = . 0708 in . / Volt Equivalent of Calibration - in. $D_c = V_a \cdot S = (.S) / .0706 .0354$ (TMG)(LG) Log Converter Setting Analyzer Attenuator Setting Calibration Plotted at In.²/cps Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(V_c) psi

2

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c.

CALC	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	Vol. I
CHECK RDS 101	3		OF DISPLACEMENT PICKUP	02-80084
APR.			THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG. 100



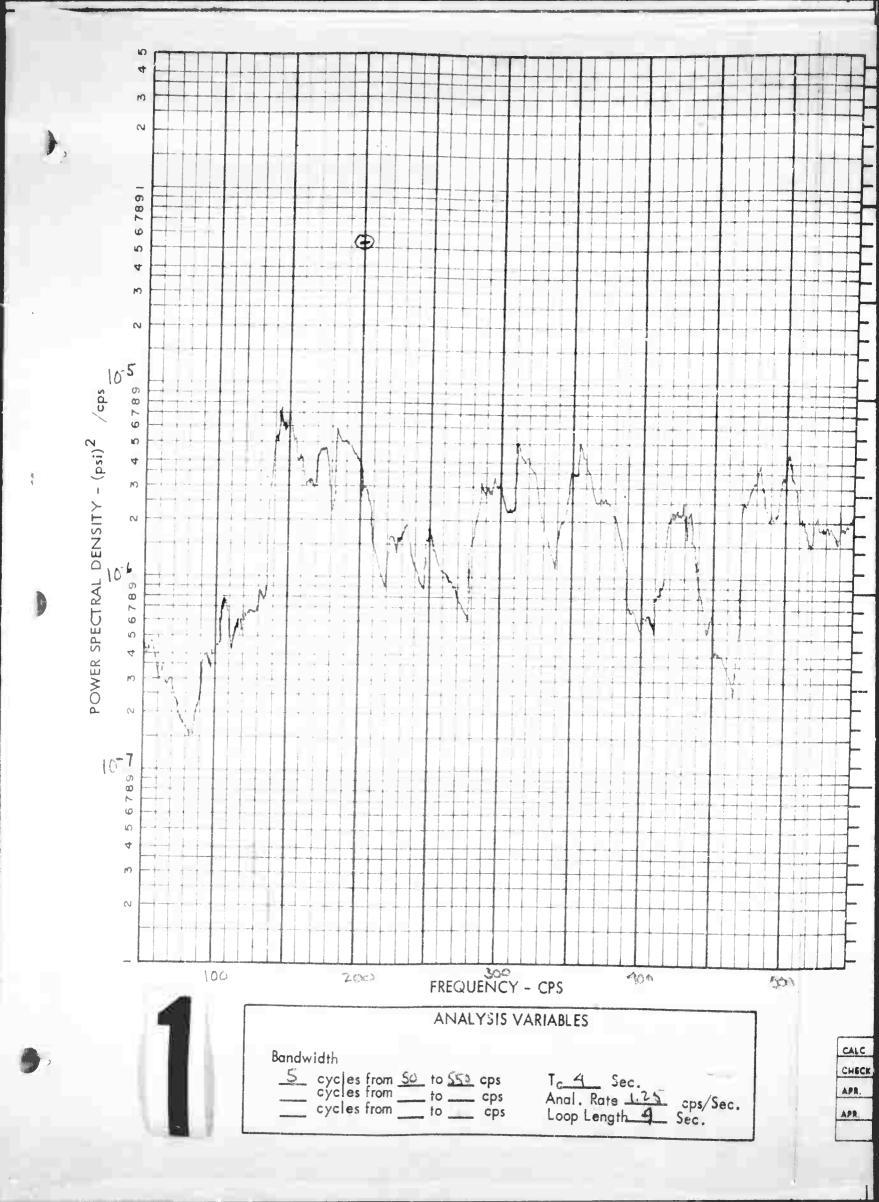
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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

EWA No.	Pai	nel or S	PRELIM. pecimen No.
2203-1			18
Tape No.	Tape Channel		Mic. No.
12	1 2		
Elapsed Test Time	M	c. RMS	Level at Sonic Lab.
		=	Volts

	CALIBRAT	ION		
Tape No.	Tape Channe		Data Tape RM $V_{R} = .$	S Volt
Calibration Voltage V _a ≈ V _{rms} into Line	Amp.; V _c =	.5 V	rms on Tape @	⊖⊜ cps
Line Amplifier Settin For Calibration G _c	a			
Lab. Gain LG =	Tape Monito	or Gain T	$MG = \frac{G_d}{G_c} =$	
Microphone Sensitivi S = ,790 psi/Vol	ty t or 1 Volt m	ns = \	60 db SPL	
Equivalent of Calibra Pc = V . \$	tion - psi = (.5) (.290)	0.145	
Equivalent of Calibra $\frac{P_c}{(TMG)(LG)}$	ation for PSD	Plots		psi ² /cps
Analyzer Attenuator		Log	Converter Setti d	ng
Calibration Plotted a				ps1 ² /cps
Overall Pressure Level	el Data (P _c) (\ (TMG)(LC	√R)	quiv. to	db SPL
=				psi

CALC	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	ign.
CHECK 1/2			OF MICROPHONE OUTPUT	OF KIRA
APR.			1/1/12 1/1/1	PAGE
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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

Test Title
FANEL ATTACH TYPE I PRELIM
EWA No.

Panel or Specimen No.

12

Tape No.

Tape Channel

Mic. No.

12

Elapsed Test Time

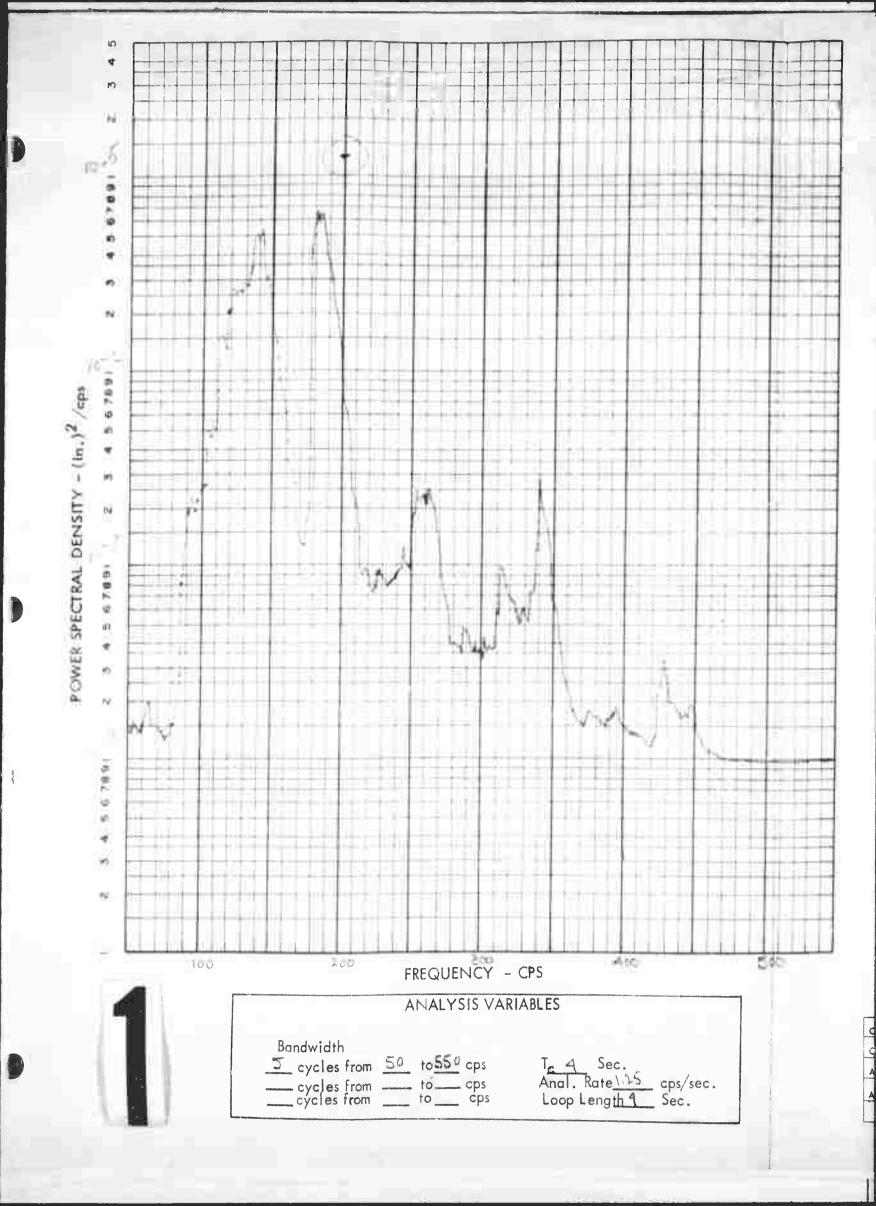
Mic. RMS Level at Sonic Lab.

VL = Volts

CALIBRATION

	CALIBR	ATION					
Tape No.	Tape Chan	nel	Data Tape RV	IS Volt			
12	1		∨ _R ==				
Calibration Voltage			on Tana				
$V_{a} = .5 V_{rms}$ into Line Amp.; $V_{c} = V_{rms}$ on Tape @ cps							
Line Amplifier Settin For Calibration G _c	gs	for Data G	2				
Lab. Gain	Tane Mon	itor Gain -	Gd				
LG =	Тарс	1	$MG = \frac{G_d}{G_c} =$	A.,			
Microphone Sensitivi							
S = 190 psi/Vo	t or 1 Volt	mis = 16	O db SPL				
Equivalent of Calibra	ition - psi		13.1				
$P_{c} = V_{a} \cdot S$	= (.5)(2.401	195				
Equivalent of Calibra	ation for PS	D Plots					
P_{c}	1	17 1-5	26×10-3	.2 .			
(TMG) (LG)	garne g	Y 2	.26×10-3	ps14/cps			
Analyzer Attenuator	Setting	Log	Converter Sett	ing			
- 10	db			lb			
Calibration Plotted o	5.21	×10-5		psl ² /cps			
Overall Pressure Lev	el Data	E	quiv. to	db SPL			
RMS pressure Level			to protect the consequence of th				
·	(TMG)(LG)(V _c)					
T trans- grass	ganagigapininkinking/majorakiga-akigap						
				psi			

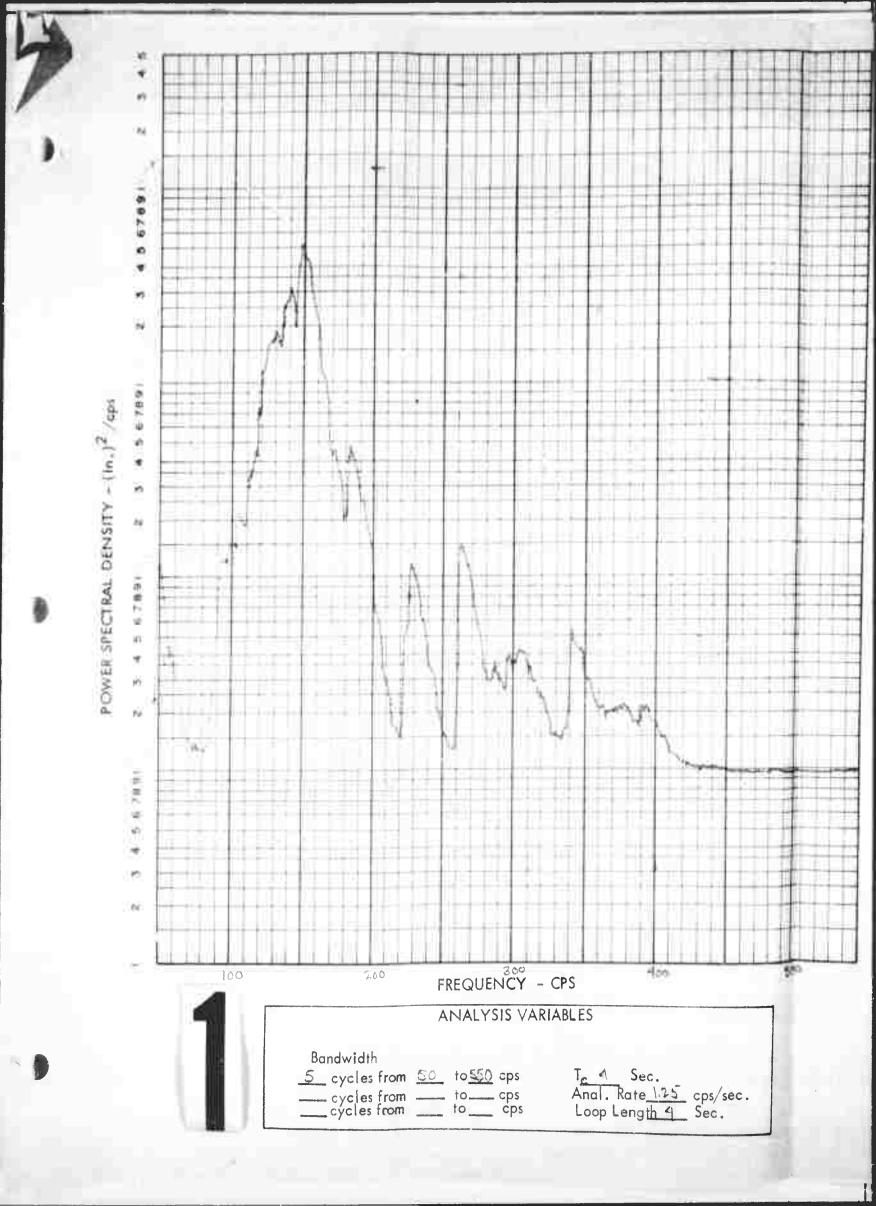
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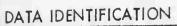


Test Title			
PANEL ATTA	TY	PE I F	KELIN M
EWA No. 5593	aus l	Panel or Sp	pecimen No.
Tape No.	Tape Chan	nel	Displacement Pickup
Elapsed Test Time		P/U RMS L VL =	evel at Sonic Lab. Volts

CALIBRATION Data Tape RMS Volt Tape No. Tape Channel VR = (175 12 Calibration Voltage Va = . '5 Vms Into Lirie Amp.; Vc = . 5 Vms on Tape 200 cps Line Amplifier Settings
For Calibration $G_c = ...$; for Data $G_d = ...$ Tape Monitor Gain TMG = $\frac{G_d}{G_a}$ = Lab. Gain LG = Displacement Pickup Sensitivity S = .070B in./VoltEquivalent of Calibration - In. $D_c = V_a \cdot S = (.5)(.0709)$.0354 Equivalent of Calibration for PSD Plots 1.25 × 10⁻¹ in. ²/cps (TMG)(LG) Analyzer Attenuator Setting Log Converter Setting - 2 0 db Calibration Plotted at In. 2/cps Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(V_c) psi

CALC HOL HOLLS	REVISED		MENT PICKUP
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APR			OEING COMPANY PAGE E 24, WASHINGTON FIG. 103





Test Title PANEL ATTA	OH TYP		
EWA No. 5593	no (Panel or Sp	pecimen No. 18
Tape No.	Tape Chan	nel	Displacement Pickup
Elapsed Test Time		P/U RMS L	evel at Sonic Lab. Volts
		7 -	A0119

CALIBRATION

Tape No.	Tape Channel	Data Tape KMS Volt
12		V _R =
Calibration Voltage Va = Vms	into Line Amp.; V_{c} =	.5 V _{rms} on Tape 200cps
Line Amplifier Setti For Calibration	$G_{c} = .$; for Date	a G _{d = .} . \
Lab. Gain LG =	Tape Monitor Gain 7	$MG = \frac{Gd}{Gc} = 1$
Displacement Pickup S = .0706 in./ Equivalent of Calib	Volt ation – In.	
$D_c = V_a \cdot S =$	= (.5) .0708	. 0256
Equivalent of Calibration $\left(\frac{D_c}{(TMG)(LG)}\right)^2$	ration for PSD Plots	: 1.25 × 10 - 2/cps

(TMG)(LG)

Analyzer Attenuator Setting

— / C db

Log Converter Setting

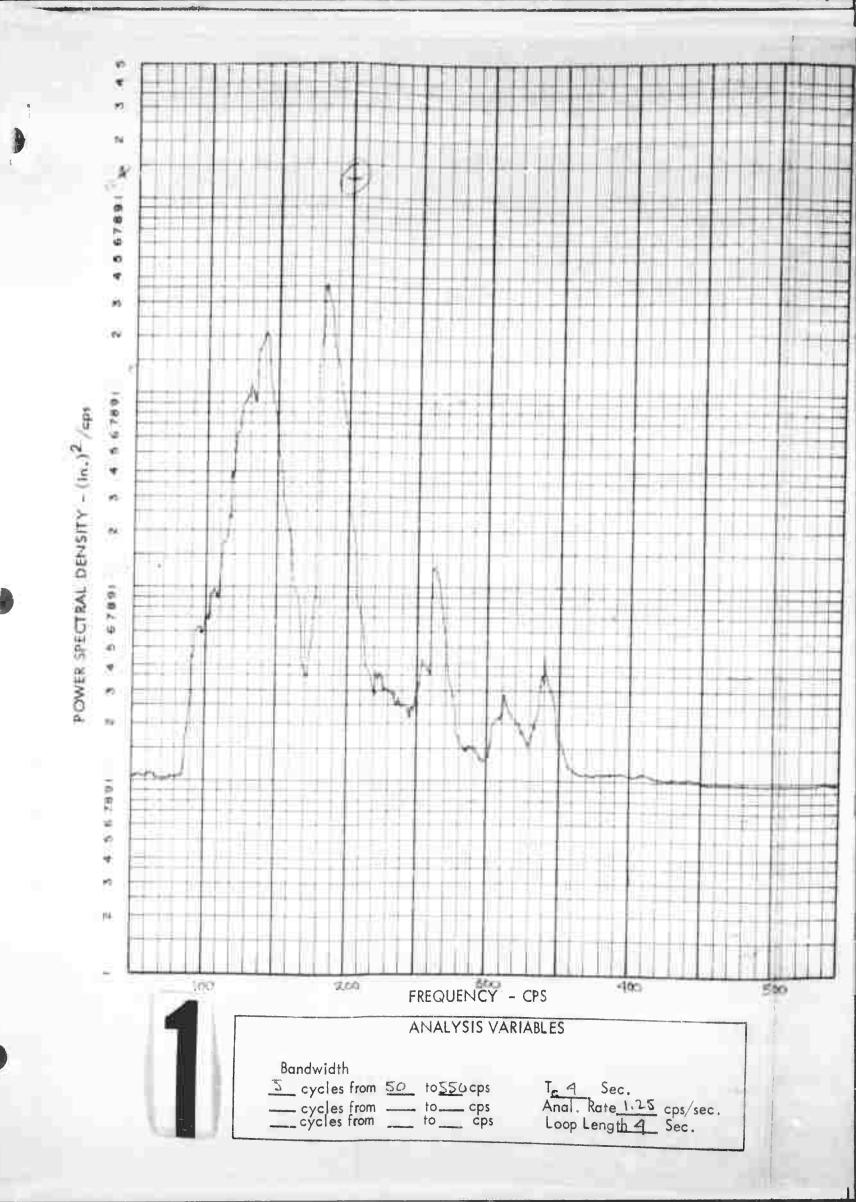
Calibration Plotted at

 \ln^2/cps

Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ = $(TMG)(LG)(V_c)$

psi

CALC		REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	May T
CHECK ROS	102-3			OF DISPLACEMENT PICKUP	V C/L ***
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APR				THE BOEING COMPANY SEATTLE 24, WASHINGTON	FIG 104





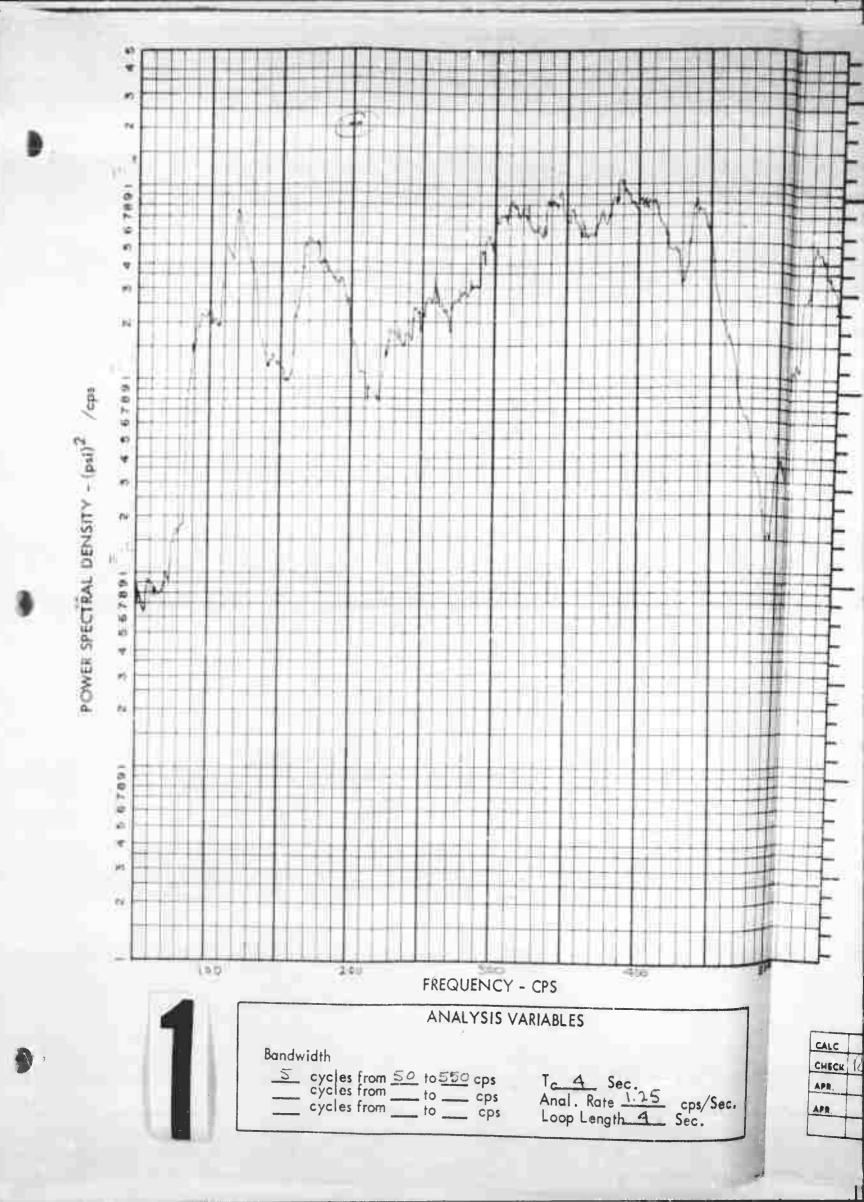
Test Title PANEL ATTAC	H TYPE I P	RELIK
EWA No.		r Specimen No.
Tape No.	Tape Channel	Displacement Pickup
Elapsed Test Time	P/U RM	S Level at Sonic Lab. - Yolts

CALIBRATION Data Tape RMS Volt Tape Channel Tape No. VR = 1,230 Calibration Voltage $V_{a} = .5 \quad V_{rms} \quad \text{Into Line Amp.; } V_{c} = V_{rms} \quad \text{on Tape 200cps}$ Line Amplifier Settings For Calibration $G_c = 1$; for Data $G_d = 1$ Tape Monitor Gain TMG = Gd = Lab. Gain LG = Displacement Pickup Sensitivity S = 0708 in./Volt Equivalent of Calibration - in. $D_{c} = V_{a} \cdot S = (.5)(.0108) = .0354$ Equivalent of Calibration for PSD Plots

Dc \2 $\left[\frac{.0354}{1 \times 1}\right]^{2} = 1.25 \times 10^{-3} \cdot \frac{2}{\text{in}} \cdot \frac{2}{\text{cps}}$ (TMG)(LG) Analyzer Attenuator Setting Log Converter Setting Calibration Plotted at In. 2/cps Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(Vc) psi

2

CALC		REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	VaI
CHECK COS	10.13			OF DISPLACEMENT PICKUP	
APR.			-	1478 P/U 6	02-80084
APR.			***************************************	THE BOEING COMPANY SEATTLE 24, WASHINGTON	FIG 105



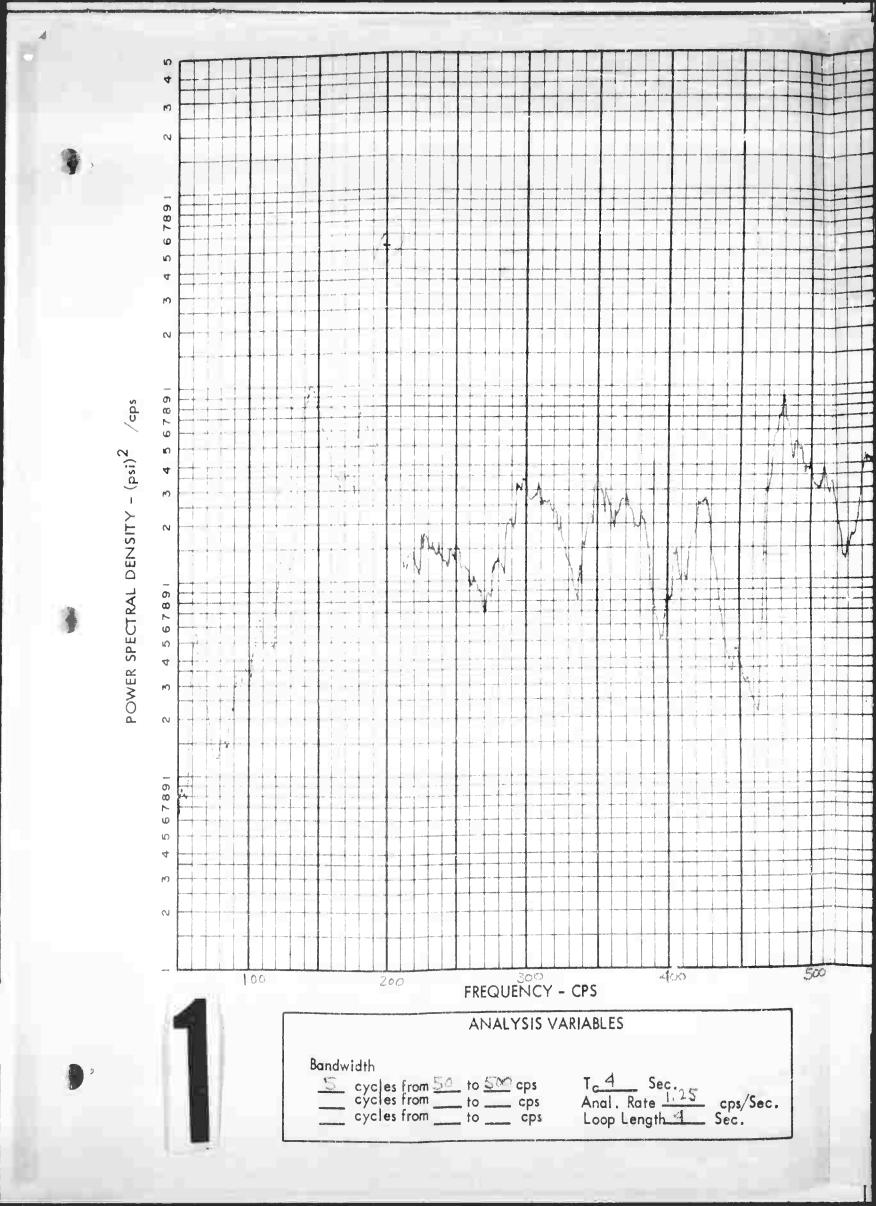
SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

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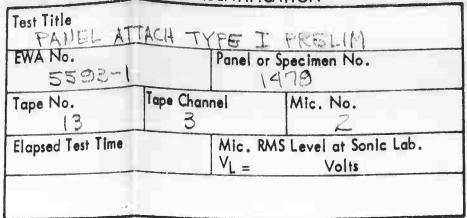
Test Title		
PANEL ATT	ACH. TYPE	I PRELIM
5593-1		Specimen No.
Tape No.	Tape Channel	Mic. No.
Elapsed Test Time	Mic. RA	AS Level at Sonic Lab. Volts

	CALIBRATIO	N	
Tape No.	Tape Channel	Data Tape R	MS Volt
13	1	V _R =	
Calibration Voltage			A
Va = 5 Vrms into Line	$Amp.; V_{c} = $	5 V _{rms} on lape	200 cps
Line Amplifier Settin For Calibration G _c	1 6 5	Data G _d = . \	
Lab. Gain LG =	Tape Monitor C	$\frac{Gain}{Gain} TMG = \frac{Gd}{Gc}$	=
Microphone Sensitivi	ty		
S = .290 psi/Vol	lt or 1 Volt mms =	160 db SPL	
Equivalent of Calibra	ntion - psi		
$P_c = V_a \cdot S$	= (.5)(.25	195	
Equivalent of Calibra	ation for PSD Plo	ts 2	
P_{c} 2	1415		•
(TMG) (LG)	[1 ×1	2.10 × 10-2	ps1 ² /cps
Analyzer Attenuator	Setting	Log Converter Set	ting
~ 2 /	db		dlı
Calibration Plotted a	it		ps1 ² /cps
Overall Pressure Lev	el Data	Equiv. to	db SPL
RMS pressure Level	(r _c) (V _R)		
	(TMG)(LG)(V	(c)	
=		larens grans agginingfrysrian	
			psi

CALC RI	344/43	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	VOLT
CHECK (LDS	0.3			OF MICROPHONE OUTPUT	
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APR.				THE BOEING COMPANY	PAGE

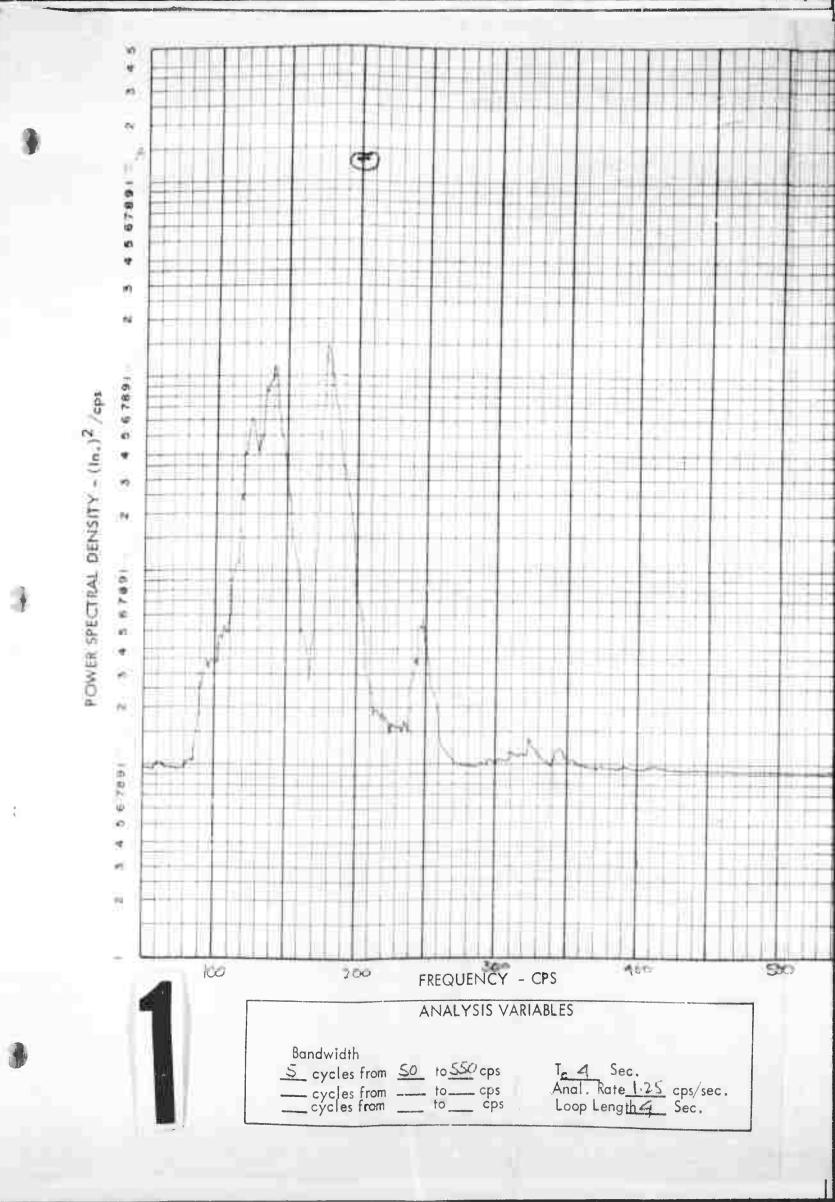


SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)



Tape No.	Tape Channel									
Tupe 140.	Data Tape RMS Volt									
13		V _R =								
Calibration Voltage										
Va = 5 V _{rms} into Line Amp.; V _c = 5 V _{rms} on Tape ® cps										
Line Amplifier Settings For Calibration $G_c =$; for Data $G_d =$										
Lab. Gain LG = $\frac{Gd}{Gc}$ = $\frac{Gd}{Gc}$										
Microphone Sensitivi	ty	11 65								
S = .290 psi/Vol	tor 1 Volt rms =	db SPL								
Equivalent of Calibra	tion - psi									
$P_c = V_a \cdot S$	= (,5)(,290)	. 112								
Equivalent of Calibra	ation for PSD Plots									
$\left(\frac{P_c}{(TMG)(LG)}\right)^2$	[.145]	5,26×10 ⁻³ ps1 ² /cps								
Analyzer Attenuator		Converter Setting								
-20		db								
Calibration Plotted a	t	ps1 ² /cps								
Overall Pressure Leve	al Data	Equiv. to db SPL								
Overall Pressure Level	(Pc) (VR)									
	(TMG)(LG)(V _c)									
BSA-F Galiff		spreads ministra								
		psi								

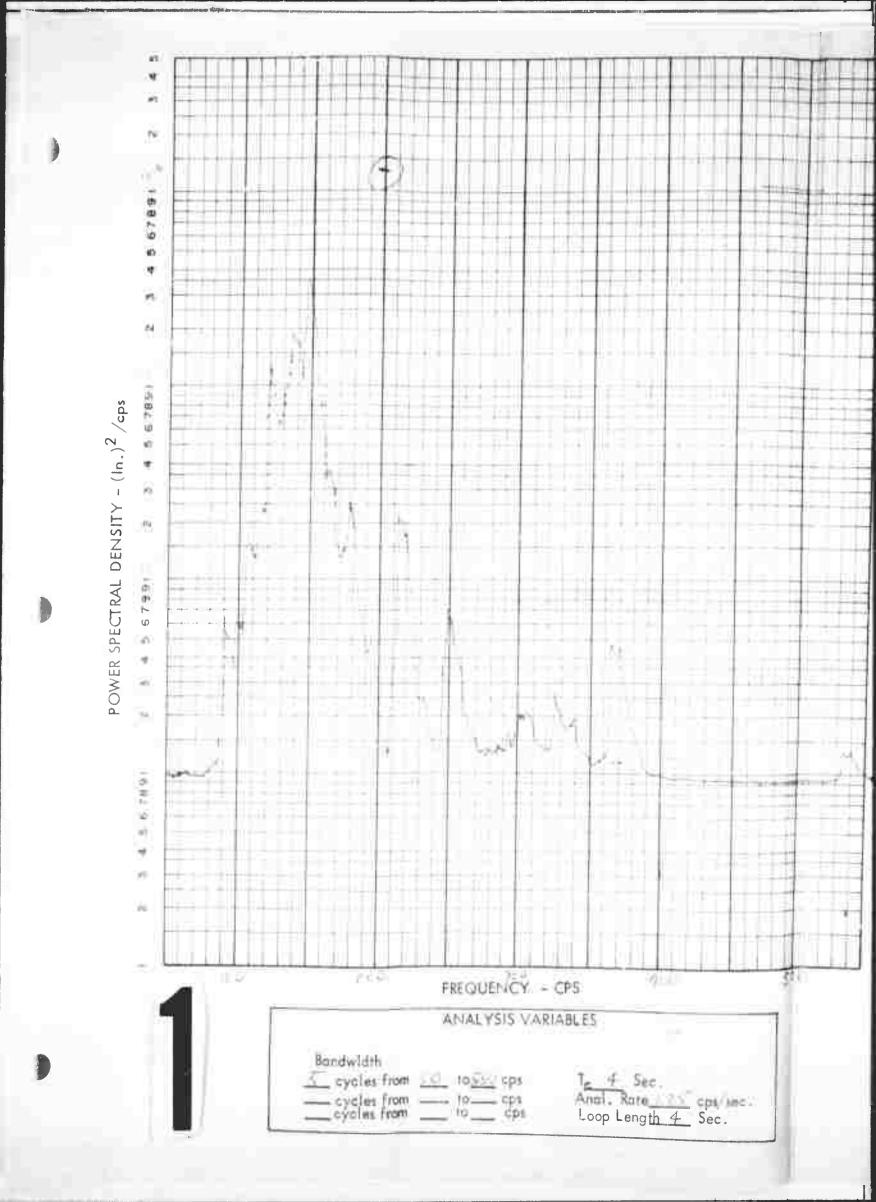
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CHECK	fus	16 65			POWER SPECTRAL DENSITY ANALYSIS	V 2/2 4x
APR.					OF MICROPHONE OUTPUT	D2-80094
APR					THE BOEING COMPANY	PAGE
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Test Title PAUEL ATTACH	TYPE	I Fol	ELIM
EWA No. 5508-		Panel or S	pecimen No.
Tape No.	Tape Chan	nel	Displacement Pickup
Elapsed Test Time		P/U RMS L VL =	evel at Sonic Lab. Volts
and the second s	ggya gyy gyyn y fernyn eigin ferin y gaeth y dei differin y dei ei eilithig ei dei dei eilithig eilith		

		RATION		
Tape No.	Tape Chann	el	Data Tape R	
/3,	1		VR = 6.23	30
Calibration Voltage Va = 5 Vms	into Line Am	, V	5 V. 0	n Tapezace
Line Amplifier Settin	nas	Silving realist title - I selver the title to the title the title to the title title to the title title to the title title to the title title title to the title t	nalisticitati da di Ministrada Pallandipani pindipani	
For Calibration	3c = .1			
Lab. Gain LG =	Tape Monito	or Gain T	$MG = \frac{G_d}{G_c} =$	
Displacement Pickup S = . 070 & in. /	,			
Equivalent of Calibra $D_c = V_a \cdot S =$	ation - in. (.5)/,070		0359	
Equivalent of Calibro $\left(\frac{D_c}{(TMG)(LG)}\right)^2 =$	ation for PSI	Plots	1.25 > 10	in. ² /cps
Analyzer Attenuator	Setting	Log Conv	erter Setting	
-/1	db		db	
Calibration Plotted o	1.25 \ 10) 1		in. ² /cps
Overall Deflection L RMS Defl. Level	evel of Date	The second secon		
				psi

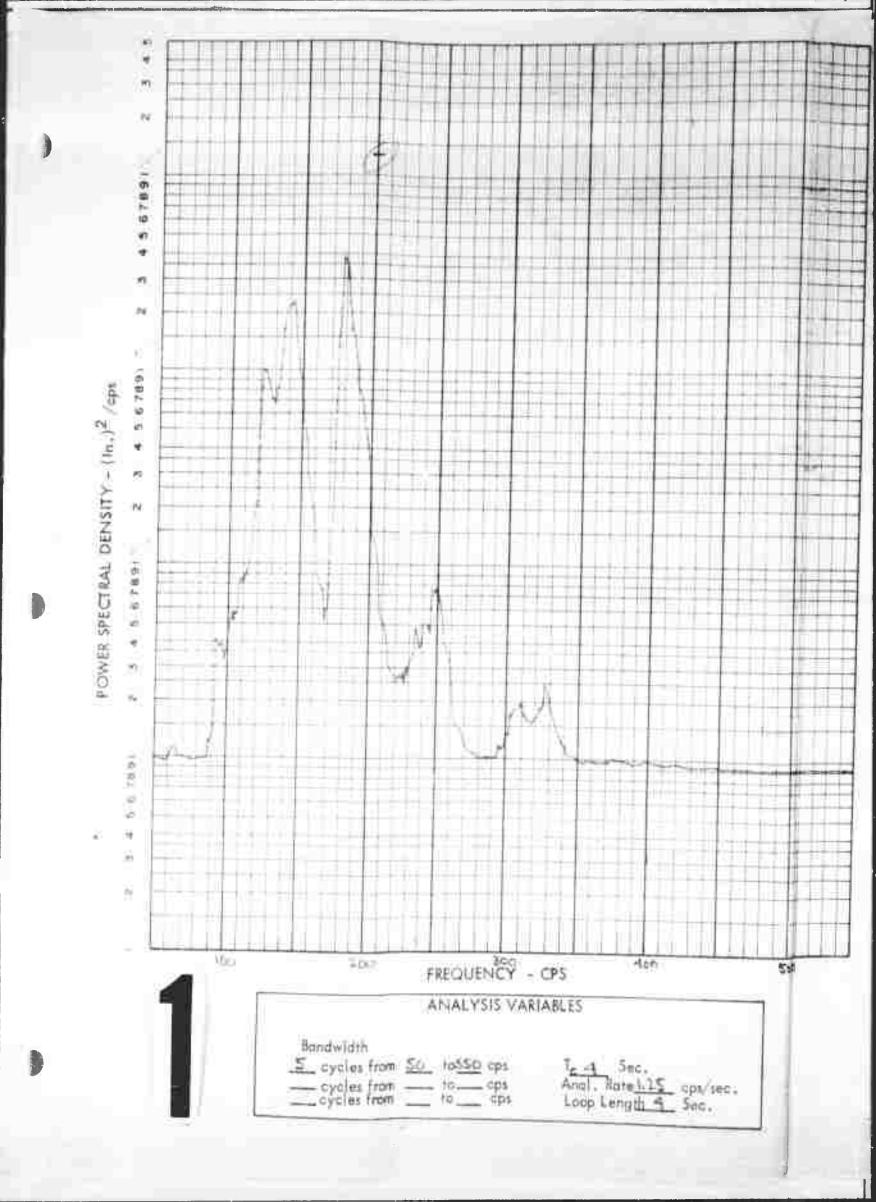
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	1	OF DISPLACEMENT PICKUP	
		1479 P/U 1	D2-90014
	-	THE BOEING COMPANY	PAGE
	REVISED.	REVISED DATE	OF DISPLACEMENT PICKUP



Test Title	TACH	TYPE	I PRELIM
EWA No. 557	The same of	Panel or Sp	pecimen No.
Tape No.	Tape Chan	-31/04	Displacement Pickup
Elapsed Test Time		P/U RMS L	evel at Sonic Lab. Volts

process to the second s	CALIBRATIO	
Tape No. Tape	Channel	Data Tape RMS Volt VR = 1223
Calibration Voltage Va = Vms Into LI	ne Amp.; V _c	= 0 ~ V _{rms} on Tape=acp
Line Amplifier Settings For Calibration Gc =		
Lab. Gain Tape /	Monitor Gain	$\frac{1}{G_c} = \frac{G_d}{G_c} = \frac{1}{G_c}$
Displacement Pickup Sensit S = 4 in./Volt Equivalent of Calibration -	In.	
$ \begin{array}{c c} D_c = V_a \cdot S = 68 \\ \hline \text{Equivalent of Calibration fo} \\ \left(\frac{D_c}{(TMG)/(G)}\right)^2 = 68 \end{array} $	or PSD Plots	in. ² /cps
Analyzer Attenuator Setting		
Calibration Plotted at		$1 n.^2/cps$
Overall Deflection Level o RMS Defl. Level = (D (TMG		
	er en en -gergrendighet egheterigjerer tijd in gendittijkepropengunddir en	psi

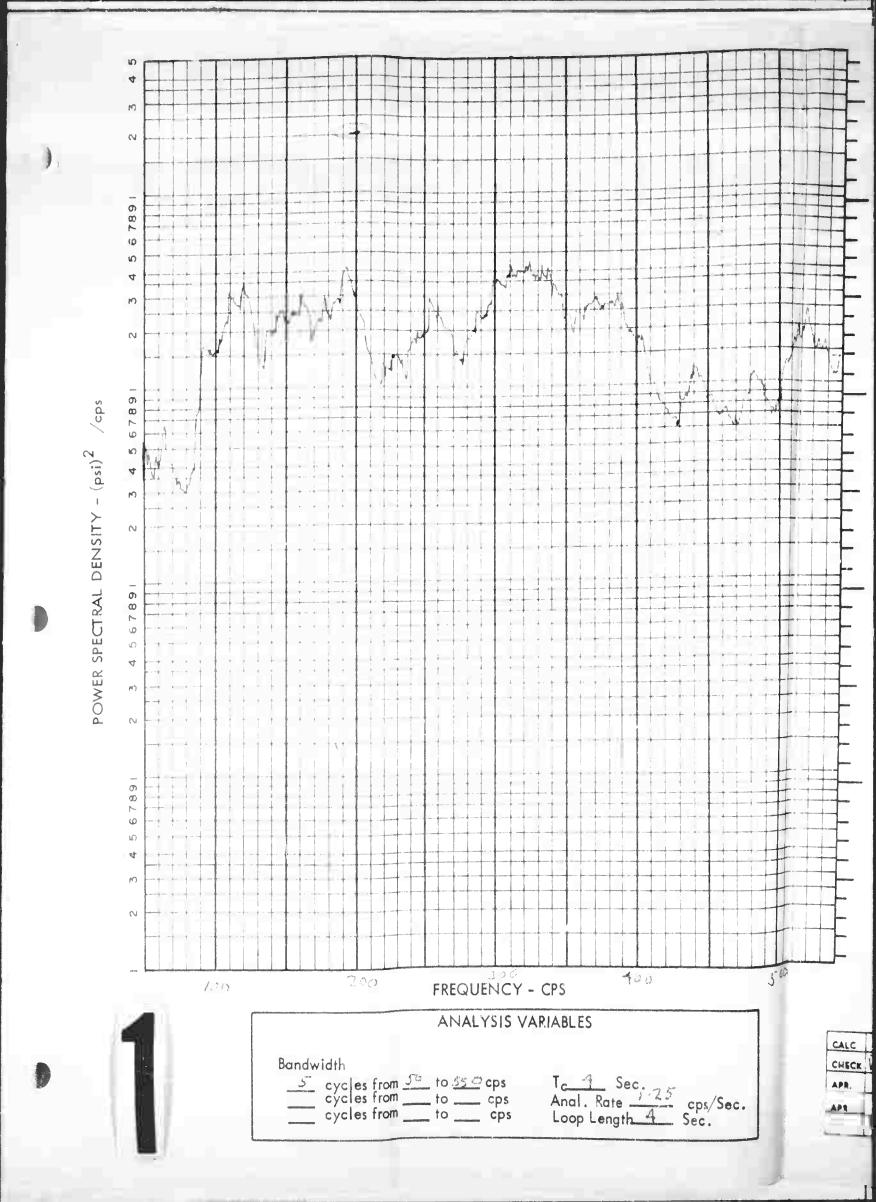
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Test Title	TYPEI	PRELIM.
EWA No. 5593	Pari	nel or Specimen No.
Tape No.	Tape Channel	Displacement Pickup
Elapsed Test Time	P/U V	J RMS Level at Sonic Lab. /L = Volts

CALIBRATION Data Tape RMS Volt Tape No. Tape Channel V_R = 6.344 13 Calibration Voltage $V_a = .5$ V_{rms} Into Line Amp.; $V_{c} = .5$ V_{rms} on Tape 200cps Line Amplifier Settings For Calibration $G_c = ...$; for Data $G_d = ...$ Tape Monitor Gain TMG = $\frac{G_d}{G_c}$ = Lab. Gain LG = Displacement Pickup Sensitivity S =, 0708 in./Volt Equivalent of Calibration - In. Dc = Va · S = (.5) 0766 = .0:59 Equivalent of Calibration for PSD Plots in. 2/cps (TMG)(LG) Analyzer Attenuator Setting Log Converter Setting Calibration Plotted at $\ln \frac{2}{cps}$ Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ $(TMG)(LG)(V_c)$ psl

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CHECK	RDS	10:3	OF DISPLACEMENT PICKUP	A Section of the same
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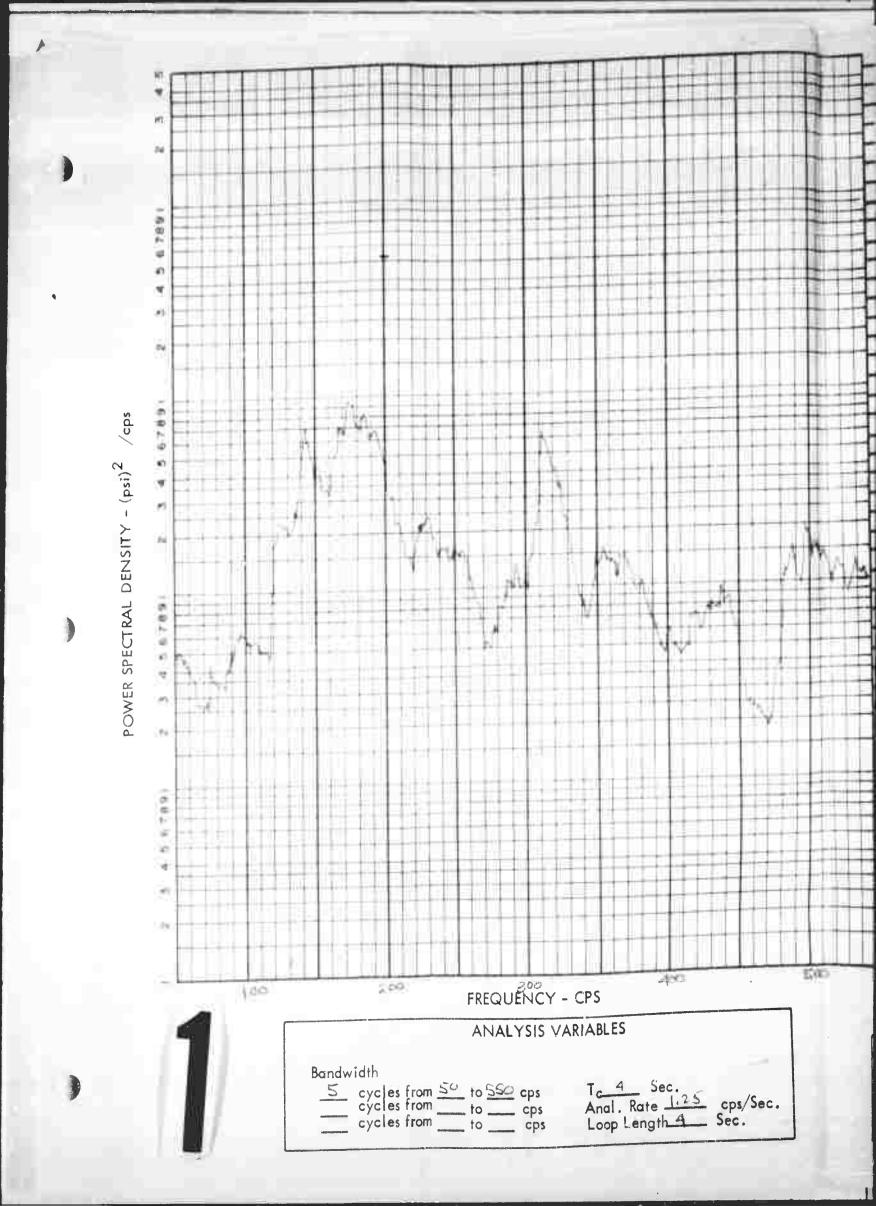
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Test Title			and the second of the second o
PANEL A	TTCH		I PRELIM.
EWA No.		Panel or S	pecimen No.
5593-1		1470	
Tape No.	Tape Chan	nel	Mic. No.
Elapsed Test Time		Mic. RMS VL =	Level at Sonic Lab. Volts

CALIBRATION

Tape No.	Tape Char	nel	Data Tape RM V _R = 3				
Calibration Voltage	\		'K = 3	20			
$V_{a} = V_{rms}$ into Line	Amp.: V	£	V_ on Tape ®	o cps			
Line Amplifier Settin			mis 20				
For Calibration Gc	=	for Data	$G_{d} = -1$				
Lab. Gain LG =	Tape Mor	itor Gain	$TMG = \frac{G_d}{G_c} =$	1			
Microphone Sensitivi			1				
S = . 297 psi/Vol		ms =	GO db SPL				
Equivalent of Calibra	tion - psi		13 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -				
$P_c = V_a \cdot S$	= (,5	3 (. 24	0)= . 145				
Equivalent of Calibra $\frac{P_c}{(TMG)(LG)}^2$	Equivalent of Calibration for PSD Plots $ \left(\frac{P_c}{(TMG) (LG)}\right)^2 = \left(\frac{.145}{/}\right)^2 = 2.10 \times 10^{-2} \text{ psi}^2/\text{cps} $						
Analyzer Attenuator			Converter Setri				
-20	db		dt dt				
Calibration Plotted a	2.	10 1	7	psl ² /cps			
Overall Pressure Leve	Data		Equiv. to	db SPL			
RMS pressure Level	(Pc)	(V R) L					
	(TMG)($LG)(V_c)$					
q-ui deris		Marin Barra wing renger opposing pass	Stocke Stocke				
		Photogram (committee which products recognitive products)		psi			

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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

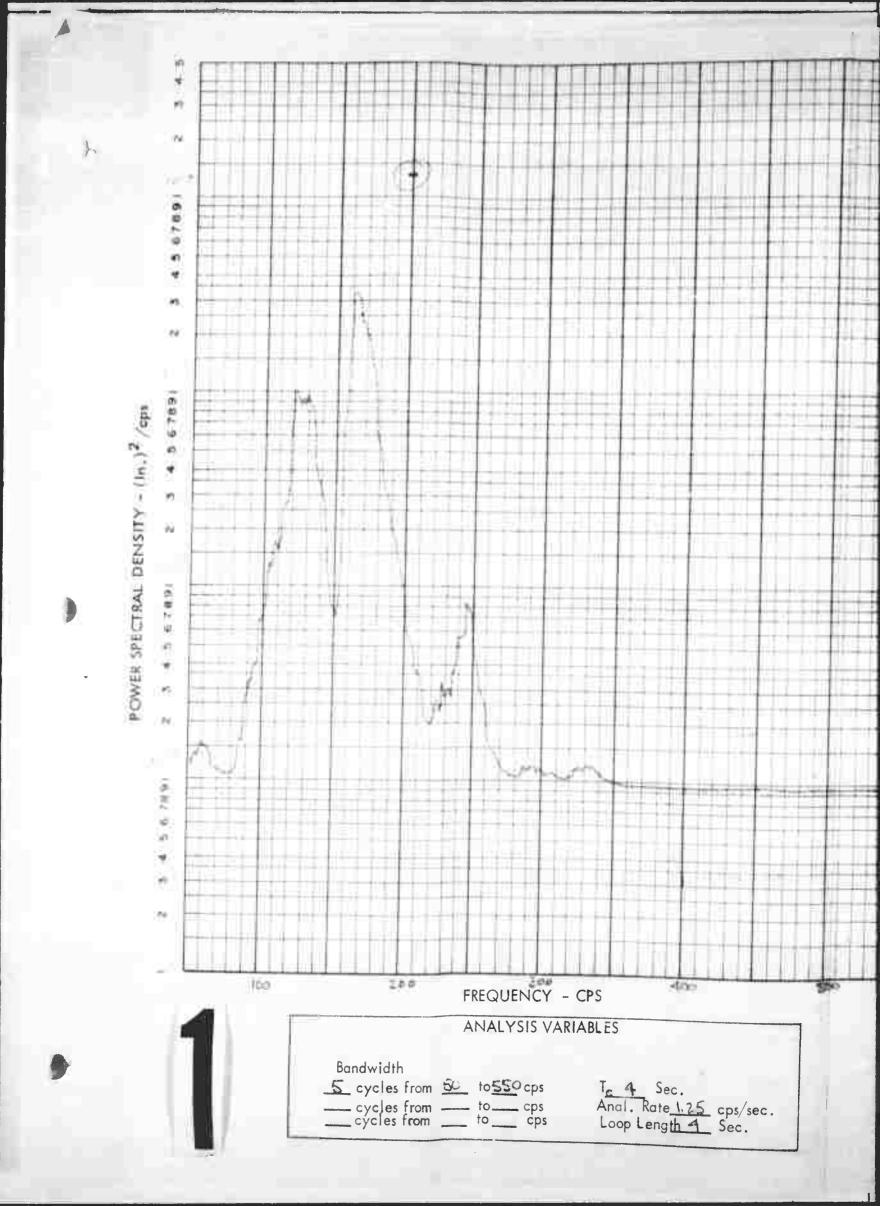
DATA IDENTIFICATION

	DAIA IDEITING	
PANEL ATTA	TYPE I	Folia Carlant I A a
	Panel or	Specimen No.
5593-1		1479
Tape No.	Tape Channel	Mic. No.
Elapsed Test Time	Mic. RA	AS Level at Sonic Lab.
		Volts
- Andrew Conference of the Con		
	4	

CALIBRATION

CALIBRATION						
Tape No. Tape Channel Data Tape R	MS Volt					
V _R =	.220					
Calibration Voltage						
Va = 5 Vms into Line Amp.; Vc = 5 Vms on Tape	© 200 cps					
Line Amplifier Settings						
Lab. Gain LG = $\frac{Gd}{Gc}$ Tape Monitor Gain TMG = $\frac{Gd}{Gc}$	= /-,					
Microphone Sensitivity						
S =, 200 psi/Volt or 1 Volt rms = 160 db SPI	-					
Equivalent of Calibration - psi Pc = V · S = (.5) - 10145						
Equivalent of Calibration for PSD Plots						
Pc / = [45] - 5.26 ×10-2						
$\left(\frac{P_c}{(TMG)(LG)}\right)^2 = \left[\frac{.145}{.2 \times 1}\right]^2 - 5.26 \times 10^{-2}$ ps1 ² /cps						
Analyzer Attenuator Setting Log Converter Se	tting					
=20 db	db					
Calibration Plotted at 5.26 A 10-5	pst ² /cps					
Overall Pressure Level Data Equiv. to	db SPL					
DAAS prossure Level (Pc) (VR)						
Overall Pressure Level Data Equiv. to RMS pressure Level (Pc) (VR) (TMG)(LG)(Vc)						
=						
Energy of the Property of the Control of the Contro	nel .					
	psi					

CALC		sprists	pars	POWER SPECTRAL DENSITY ANALYSIS	VOLI
CHECK RELES	1 2		-	OF MICROPHONE OUTPUT	170 077 Q
APR.			-	THE BOEING COMPANY	PAGE
APR			-	THE BOEING COMPANT	F16 112



Test Title PANEL ATTACH EWA No. 5593-		Specimen No.
Tape No.	Tape Channel	Displacement Pickup
Elapsed Test Time	P/U RMS VL =	Level at Sonic Lab. Volts

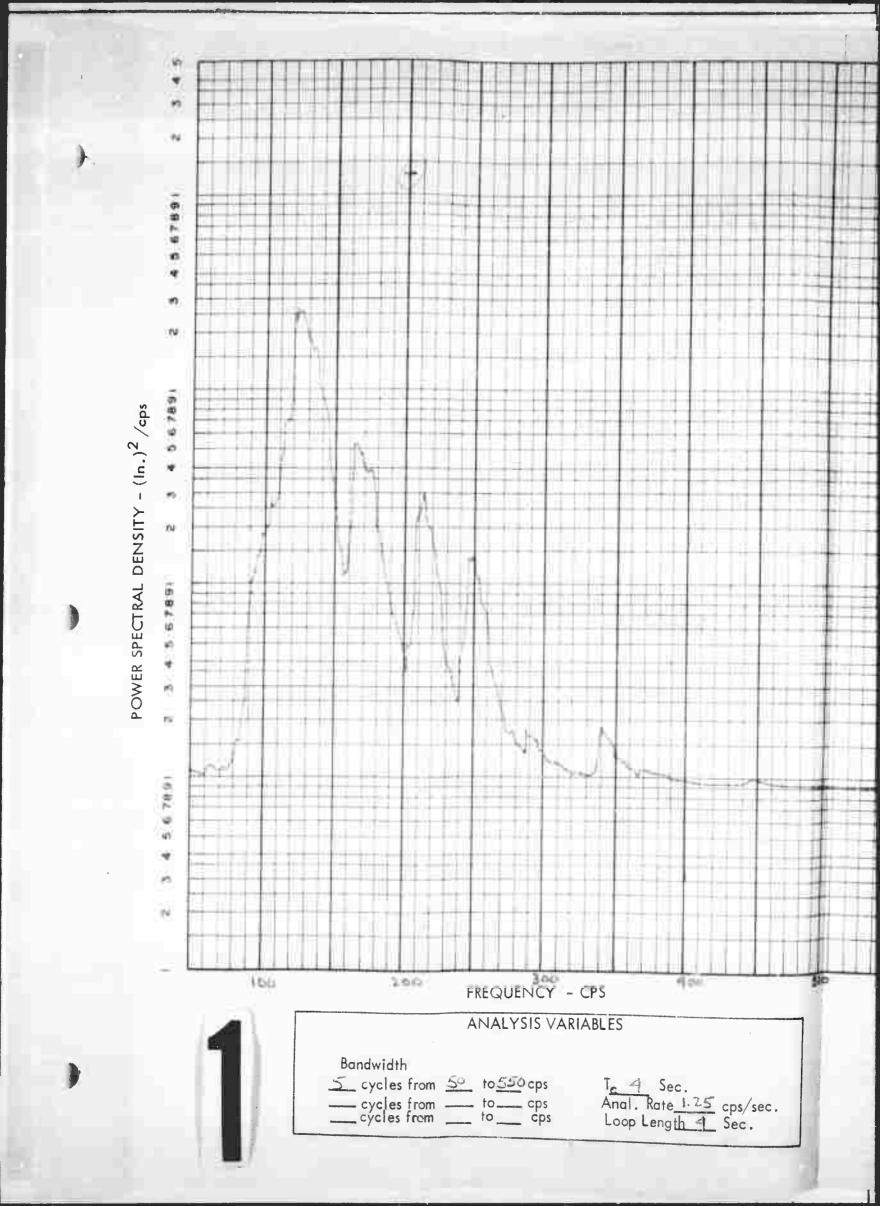
CALIBRATION

	CA	LIBRATION		
Tape No.	Tape Cho	nnel	Data Tape	RMS Volt
14			V _R =	V to
Calibration Voltag	e			
$V_{q} = .5 V_{rms}$	Into Line	Amp.; $V_{c} =$, 5 V _{rms}	on Tape? scp!
Line Amplifier Set	tings			
For Calibration	G = .1	; for Dat	$a^{G}d = .$	l
Lab. Gain LG =	Tape Moi	nitor Gain T	$MG = \frac{G_d}{G_c} =$	1
Displacement Pick	up Sensitivi	ty		
S = ,0708 in.				
Equivalent of Calil				
$D_c = V_a \cdot S$	= (.5)(.	0708) 7	.0354	11)
Equivalent of Calib	oration for F	SD Plots	The second secon	
D _c 2	= [.03	541.	25 x 10	3
(TMG)(LG)	1 17			in. ² /cps
Analyzer Attenuate	or Setting	Log Conv	erter Setting	
-10			db	
Calibration Plotted	at	- 7-		2.
		× / *		In. ² /cps
Overall Deflection				
RMS Defl. Level	The second secon			
	(TMG)(LC	3)(V _c)		
=		Surpering and service of the service		
				psi

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CALC KES	gharlos REVIS	ED DATE	POWER SPECTRAL DENSITY ANALYSIS	1
CHECK RAS	10-13		OF DISPLACEMENT PICKUP	VOLL
APR.			1479 PIU 1	D2-8-08
APR			THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 113

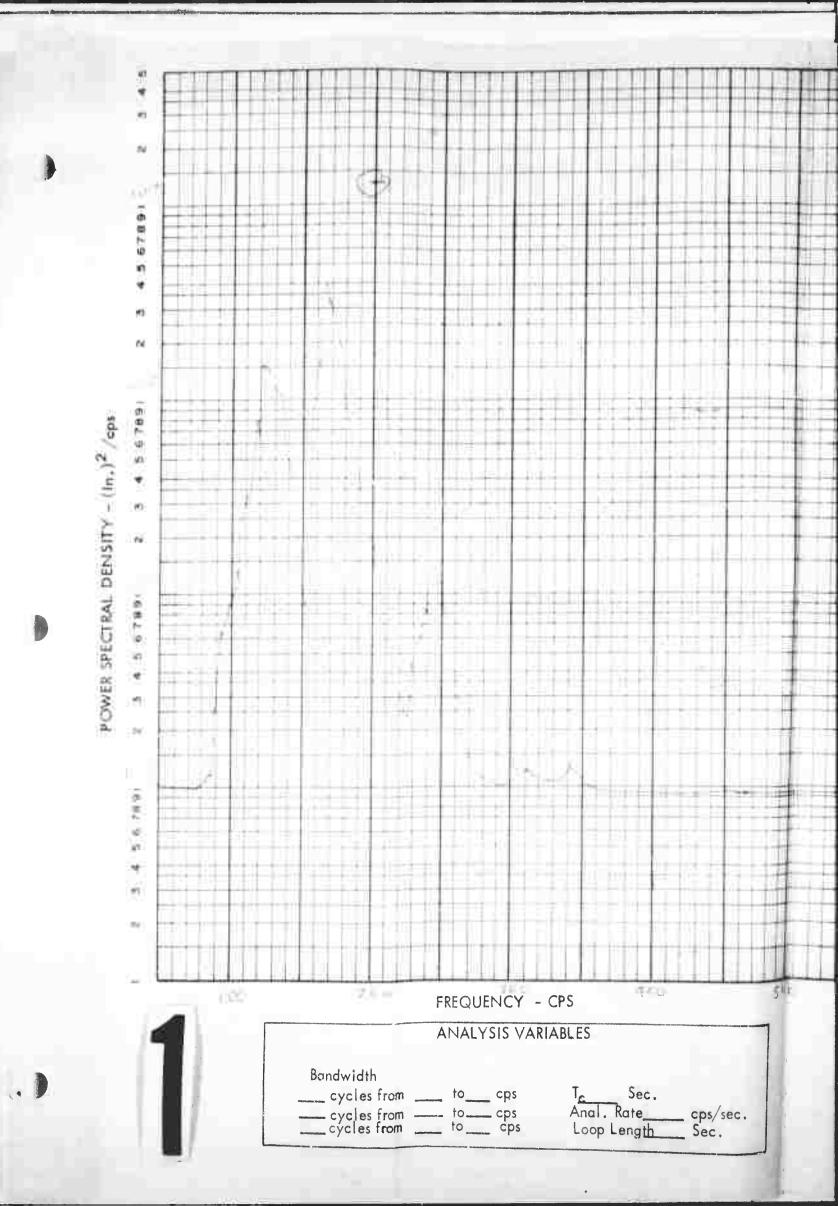




EWA No.	Panel or	r Specimen No.
Tape No. 14	Tape Channel	Displacement Pickup
Elapsed Test Time	P/U RMS VL =	S Level at Sonic Lab. Volts

CA	LIBRATION		
Tape No. Tape Cho	innel \	Data Tape RM	
Calibration Voltage Va = 5 V _{rms} Into Line	Amp.; V _c =	. 5 V _{ms} on	Tape 200cps
Line Amplifier Settings For Calibration Gc = **	; for Date	$G_d = 1$	
Lab. Gain Tape Mon	nitor Gain T	$MG = \frac{G_d}{G_c} = \frac{1}{1}$	
Displacement Pickup Sensitivi S = 0708 In./Volt	ty		
Equivalent of Calibration - In $D_c = V_a \cdot S = (.5)$ (.6)		0254	
Equivalent of Calibration for I $\left(\frac{D_{c}}{(\text{TMG})(\text{LG})}\right)^{2} = \left(\frac{1}{2}\right)^{2}$	PSD Plots	1.25 × 10 3	in. ² /cps
Analyzer Attenuator Setting			
Calibration Plotted at	And confinence to the confinence and confinence and confinence	În	. ² /cps
Overall Deflection Level of D RMS Defl. Level = $(D_c)(V_c)$	/R) =		
			psi

CALC CHECK	10-4-5	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS OF DISPLACEMENT PICKUP	VolI
APR.				1479 P/U 5	DZ-81.684
APR.				THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG. 114

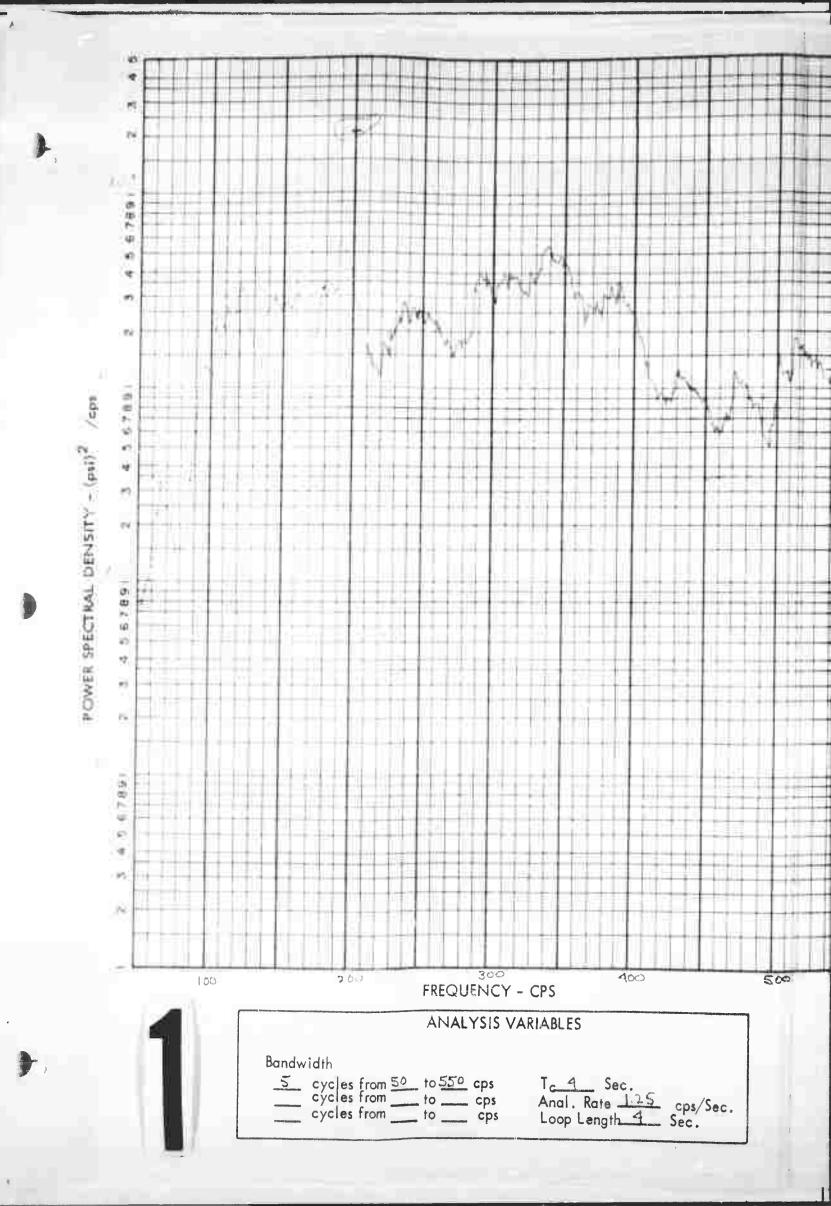




Test Title PANEL AT	TACH	TYPE	E I PRELIM
EWA No. 559	3-1	Panel or Sp	pecimen No.
Tape No.	Tape Chan	nel 6	Displacement Pickup
Elapsed Test Time		P/U RMS L	evel at Sonic Lab. Volts

CALIBRATION
Tape Channel Data Tape RMS Volt Tape No. VR = 0.260 Calibration Voltage $V_{a} = V_{rms}$ into Line Amp.; $V_{c} = 0.5 V_{rms}$ on Tape Line Amplifier Settings
For Calibration $G_c = G_c : for Data G_d = G_c$ Tape Monitor Gain TMG = $\frac{G_d}{G_a}$ LG = Displacement Plakup Sensitivity S = 0.70% in./Volt Equivalent of Calibration - In. Dc = Va · S = (0.5)(0.0708) = 0.0354 Equivalent of Calibration for PSD Plots (TMG)(LG) Analyzer Attenuator Setting Log Converter Setting m/ G db Calibration Plotted at $in.^2/cps$ Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ $(TMG)(LG)(V_c)$ psi

CALC ICES	17/2010 REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	VOLT
CHECK P.DS	10-43		OF DISPLACEMENT PICKUP	A 0.0 T
APR.			1479 P/U 6	02-80084
APR			THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 115



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			-	E
			-	SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)
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-	energy same		1_	S
			-	

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DATA IDENTIFICATION

Test Title PANEL ATTACE EWA No. 5500-1	Panel or S	pecimen No.
Tape No.	Tape Channel	Mic. No.
Elapsed Test Time	Mic. RMS	Level at Sonic Lab. Volts
	V _L =	Volts

CALIBRATION

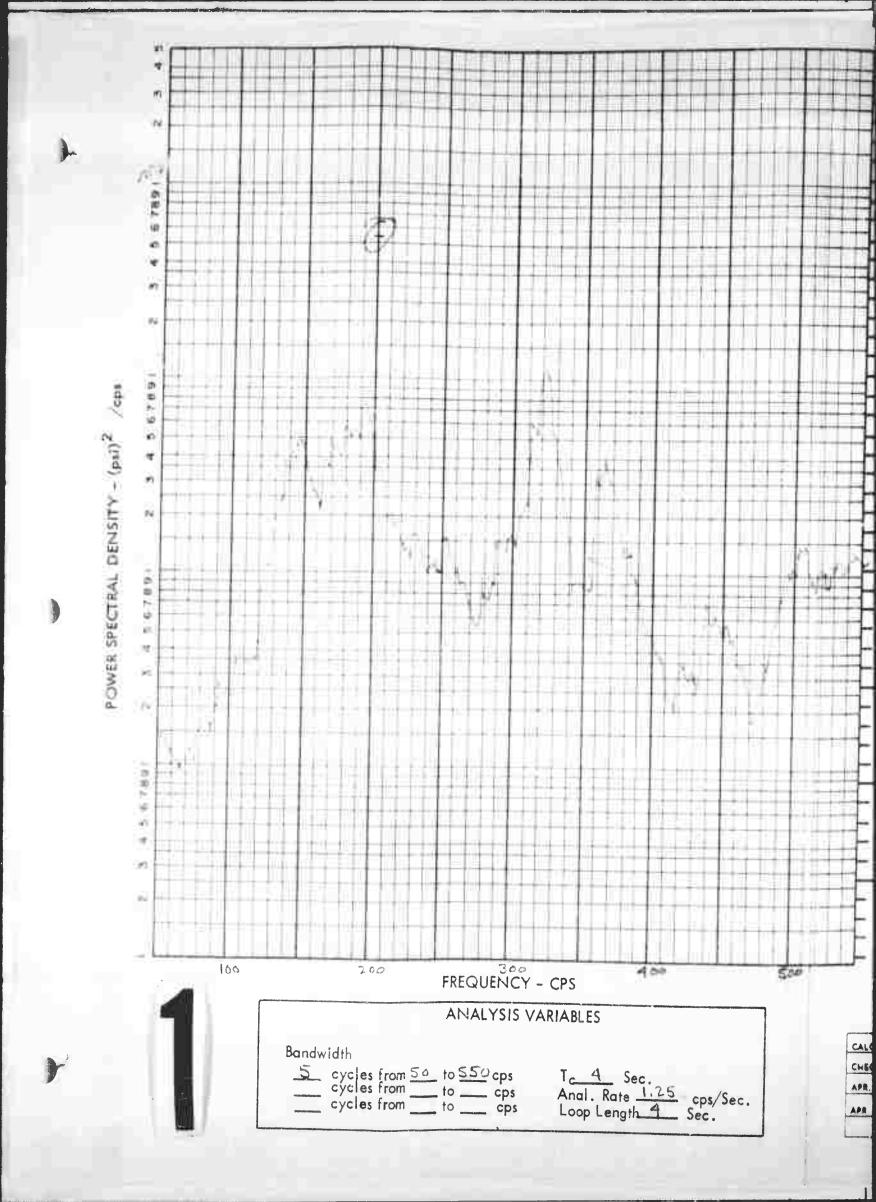
	CALIBRATION	
Tape No.	Tape Channel	Data Tape RMS Volt VR =
Calibration Voltage $V_{a} = .5V_{rms}$ into Lin	e Amp.; V _{c = .5}	V _{rms} on Tape @ cps
Line Amplifier Settle For Calibration G	ngs = . , for Data	G _{d = .} \
Lab. Gain LG =	Tape Monitor Gain	$TMG = \frac{G_d}{G_c} = $
Microphone Sensitiv S = .290psi/Vo	ity It or 1 Volt mms = \	60 db SPL
Equivalent of Calibr	ation - psi = (.5)(,210)	.145
Equivalent of Calib	ration for PSD Plots	
Analyzer Attenuato	r Setting Log db	g Converter Setting db
Calibration Plotted		ps1 ² /cps
Overall Pressure Le RMS pressure Level	(P _c) (V _R) (TMG)(LG)(V _c)	Equiv. to db SPL.
		psi

CALC STATE REVISED DATE POWER SPECTRAL DENSITY ANALYSIS OF MICROPHONE OUTPUT

APR. 1479 MIC 1

THE BOEING COMPANY PAGE

TIC. 1160



Test Title FANEL ATTACH EWA No.	TYP	EIP	RELIM pecimen No.	
5593-1			.19	
Tape No.	Tape Chann	nel	Mic. No.	
15	3		2	
Elapsed Test Time	-	Mic. RMS	Level at Sonic Lab.	
		٧_ =	Volts	

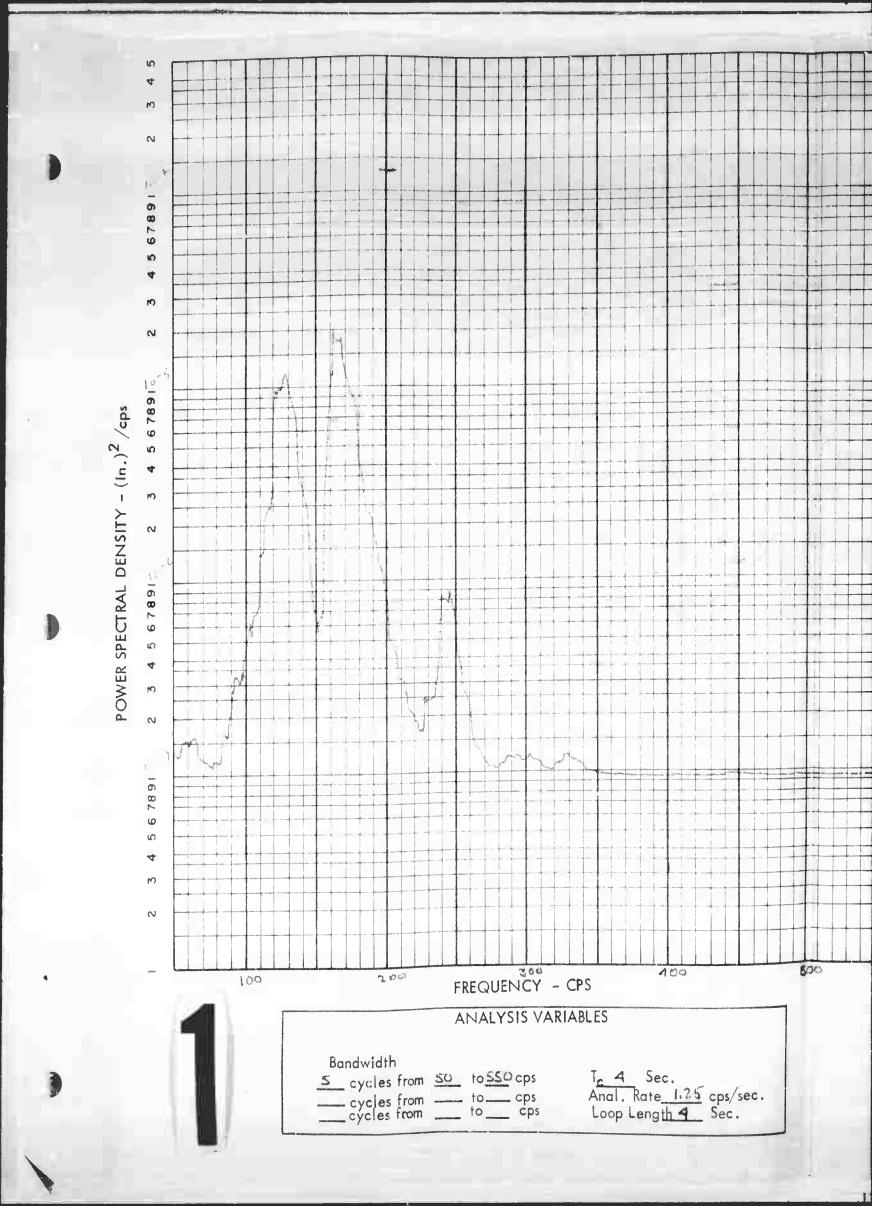
CALIBRATION

	CALIBA	ATION		
	Tape Chan		Data Tape RA	
15			V _R = .	- 5
Calibration Voltage				â
$V_a = .5V_{rms}$ into Line	Amp.; Vc	= ,5 V	ms on tape	200 cbs
Line Amplifier Setting For Calibration G _c	= . 1 ;	for Data G	d = . 2	
Lab. Gain LG =	Tape Mon	itor Gain T	$MG = \frac{G_d}{G_c} =$	= 2_
Microphone Sensitivi	ty			
S = 290 psi/Vol				
Equivalent of Calibra P = V · S	tion - psi = (.5)	(,290) =	. 145	
Equivalent of Calibra $\left(\frac{P_c}{(TMG) (LG)}\right)^2$	2	X W	5.26XI	psi ² /cps
Analyzer Attenuator	Setting	Log	Converter Set	ing
****	db			db
Calibration Plotted a	1	26 / 10.		psl ² /cps
Overall Pressure Level	Data	Ed	ulv. to	db SPL
RMS pressure Level	(Pc)	(VR) L		
·	(TMG)(LG)(V _c)		
Andreas Opinir		Name of the Park o		
				psi

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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

CALC IN TO	The 11 ASVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	Va T
CHECK Sel 5	0 1 3		OF MICROPHONE OUTPUT	A CO Communication
APR		8	1478 MG 2	DZ 81044
LPS			THE BOEING COMPANY	PAGE



EWA No. 556	03-1	Panel or S	pecimen No.
Tape No.	Tape Chan		Displacement Pickup
Elapsed Test Time		P/U RMS L	evel at Sonic Lab. Volts

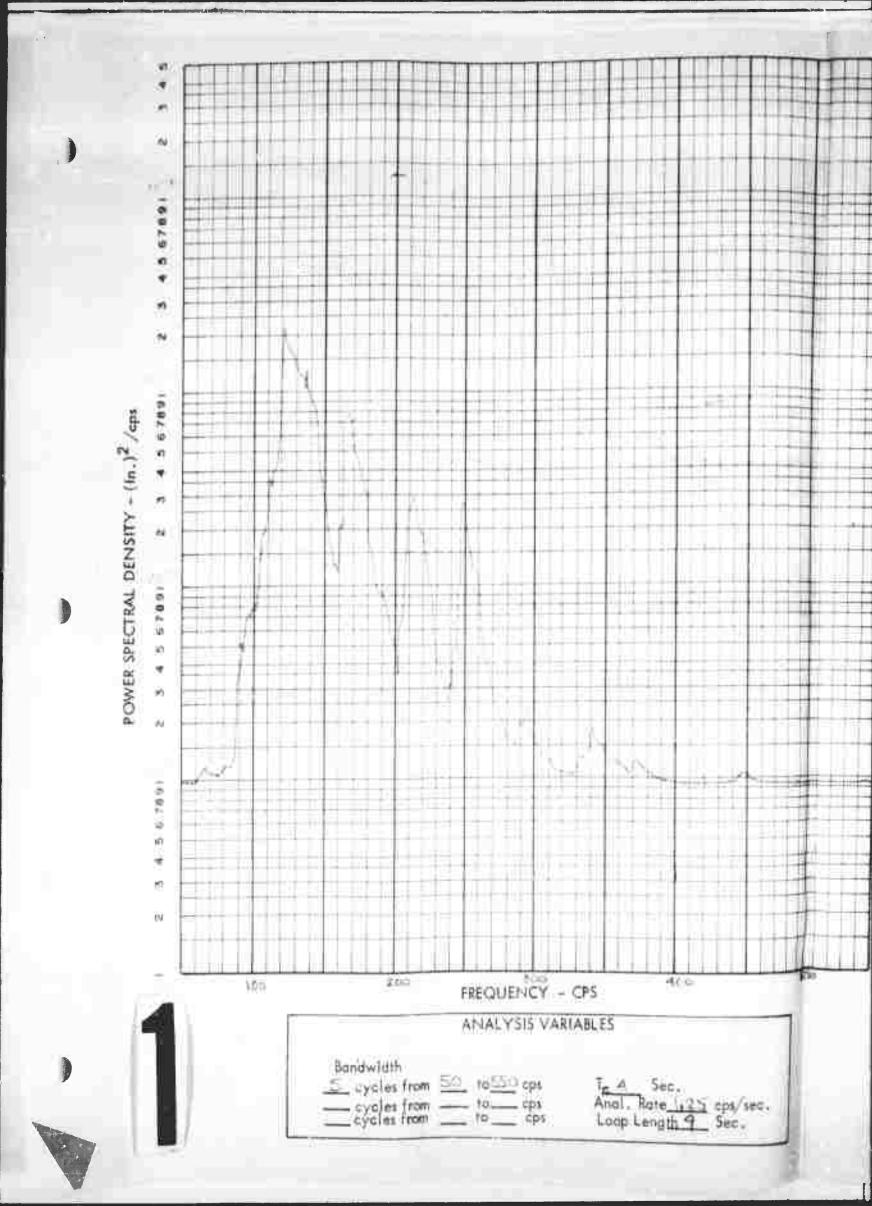
CALIBRATION Data Tape RMS Volt Tape No. Tape Channel $V_R =$ Calibration Voltage Va = .5 V_{rms} Into Line Amp.; V_{c = .5} V_{rms} on Tape 200cps Line Amplifier Settings

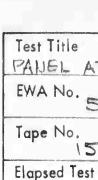
For Calibration $G_c = ...$; for Data $G_d = ...$ Tape Monitor Gain TMG = $\frac{Gd}{Gc}$ = Lab. Gain LG = Displacement Pickup Sensitivity S = , 0708 in./Volt Equivalent of Calibration - In. $D_c = V_a \cdot S = (.5)(.0708) \cdot 0354$ Equivalent of Calibration for PSD Plots

Dc 2 547 [-0354] = 1,25 ×10-3 (TMG)(LG) Analyzer Attenuator Setting Log Converter Setting Calibration Plotted at $\ln \frac{2}{cps}$ Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(V_c) psi

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CALC RES	Thomas REVISE	DATE	POWER SPECTRAL DENSITY ANALYSIS OF DISPLACEMENT PICKUP	YOLI
APR.			1479 P/U 1 .	D2: 80034
APR			THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 118

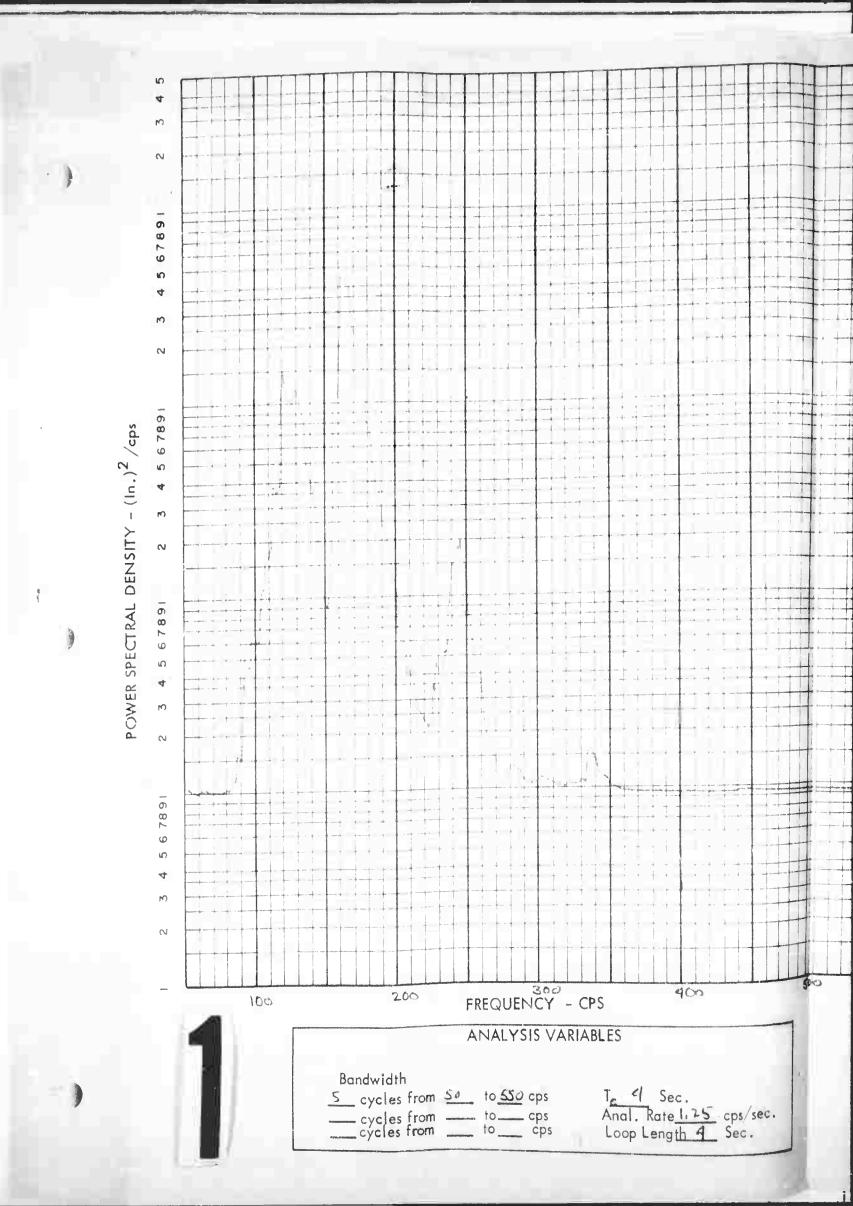




PANEL ATTAC		PRELIM
EWA No. 5598	Pane	el or Specimen No.
Tape No.	Tape Channel	Displacement Pickup
Elapsed Test Time	P/U V	RMS Level at Sonic Lab. L = Yolts

	CAL	IBRATION		*	
Tape No.	Tape Char	inel		•	MS Volt
15			V _R	= ,:	51
Calibration Voltage Va = 15 Vms	into Line A	mp.; V _c =	.5	V _{rms} o	n Tape 700cps
Line Amplifier Setting For Calibration	c = .1				
Lab. Gain LG = \	Tape Mon	itor Gain 7	MG =	$\frac{G_d}{G_c}$ =	
Displacement Plckup S = . 6768 in./	Volt				
Equivalent of Calibr $D_c = V_a \cdot S =$	(5) (.6	308)	. 635	4	
Equivalent of Calibre $\left(\frac{D_c}{(TMG)(LG)}\right)^2$	50.	54	1.25	×10-3	in. ² /cps
Analyzer Attenuator	db	Log Con	verter	Setting db	
Calibration Plotted	at / 5.5	y 10			in. ² /cps
Overall Deflection RMS Defl. Level	Level of D	ata <u>(R)</u> =			
son one	gallen aggiren agane engen en gen de franchische and de franchische an	The state of the s			psi

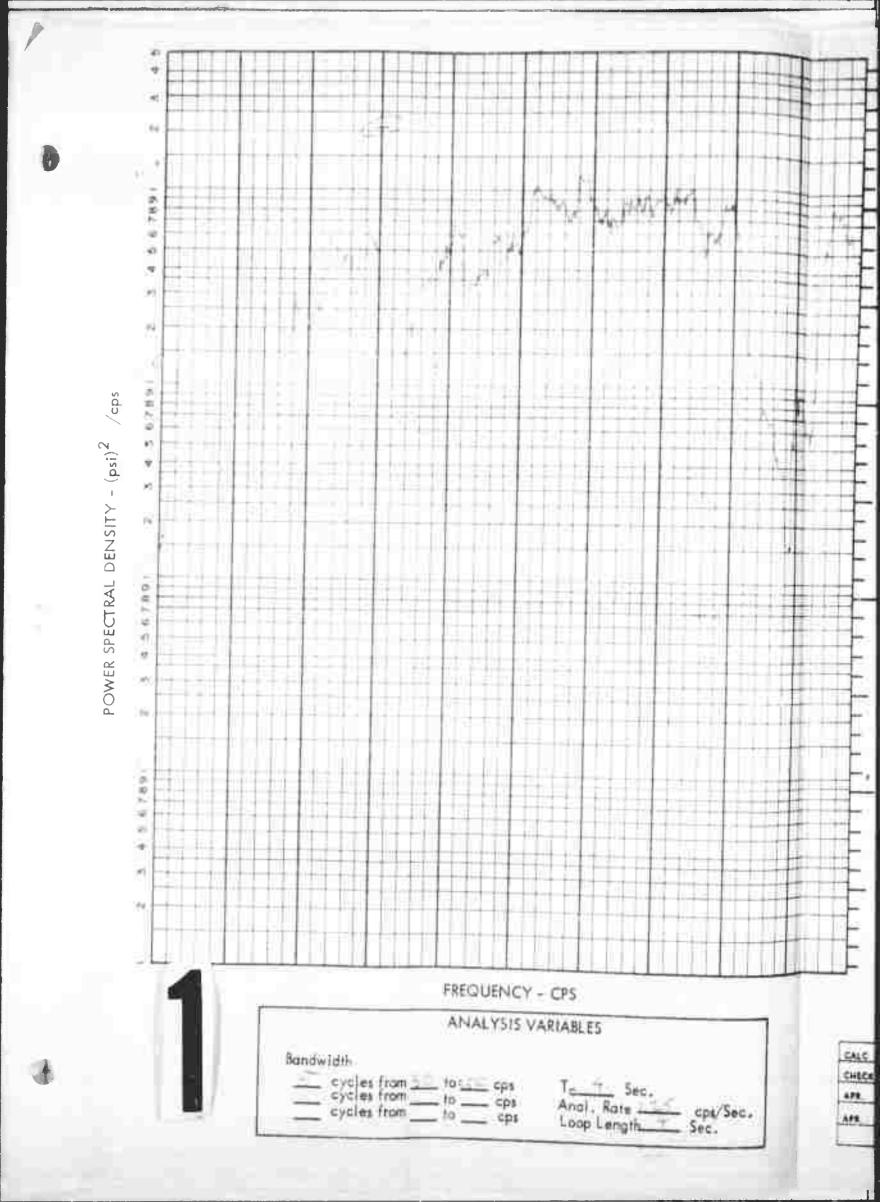
CALC C. C. C.	10 7-5	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS OF DISPLACEMENT PICKUP	VOLI
APR.				1479 P/U.5	DZ-85084
APR			any in any annual material section of the section o	THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 119



Test Title FANEL ATT	ACH TYPE	7	RELIM
EWA No. 559		Panel or	Specimen No.
Tape No.	Tape Char	inel	Displacement Pickup
Elapsed Test Time		P/U RMS VL =	Level at Sonic Lab. Volts
	tion to the control of the throught of the part of the control of		YOUS

	CAL	IBRATION		
Tape No.	Tape Char	nel	Data Tape	MS Volt
15	1		∨ _R =	1 1
Calibration Voltage	into Line A	.mp.; V _c =	. 5 V _{rms} c	on Tape 2.000ps
Line Amplifier Setting For Calibration	G = 1	; for Date	G _{d = .} .	
Lab. Gain LG =	Tape Mon	itor Galn 7	$MG = G_d = G_c$	
Displacement Pickup S = 0708 in.	Volt			
Equivalent of Calibronal $D_c = V_a \cdot S =$	ration - in. (,5) (.	(3010	.0259	
Equivalent of Calibr $\left(\frac{D_c}{(TMG)(LG)}\right)^2$	ration for P	SD Plots = 254 = =	1,25×10	$\frac{3}{\text{in.}^2/\text{cps}}$
Analyzer Attenuator	Setting	Log Conv	erter Setting db	
Calibration Plotted	at			In. ² /cps
Overall Deflection RMS Defl. Level		(R) =		
				psi

CALC CHECK	REVISED DATE POWER SPECTRAL DENSITY ANALYSIS OF DISPLACEMENT PICKUP	VOLI
APR.	1479 P/U6	07 50094
APR	THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIGURE



c.

SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

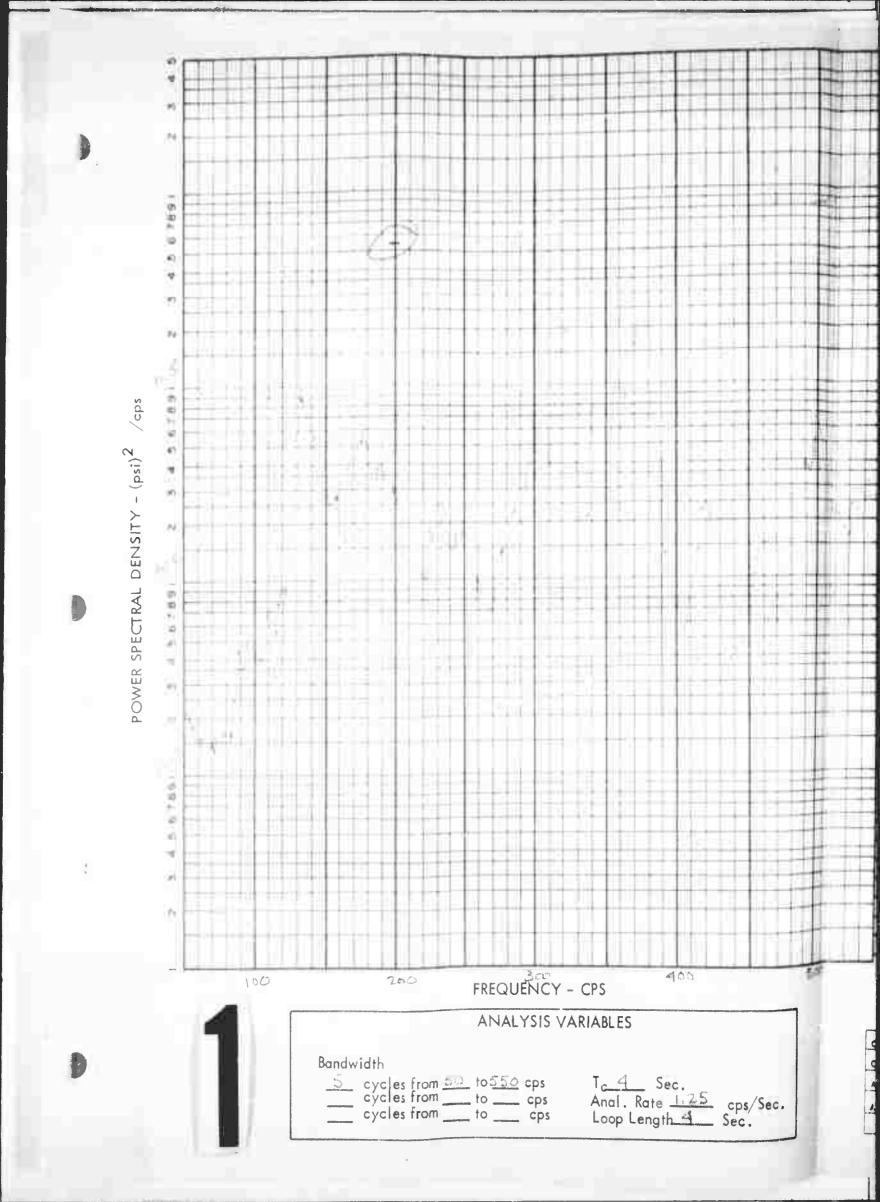
DATA IDENTIFICATION

Test Title PANEL ATT	V5H 1	YEC	I CIPELIM
EWA No. 5 115-			Specimen No.
Tape No.	Tape Chann	nel	Mic. No.
Elapsed Test Time		Mic. RN VL =	AS Level at Sonic Lab. Volts

CALIBRATION

	CALIBR	ATION		
Tape No.	Tape Char	nnel	Data Tape RA	AS Volt
/6			$V_{R} = c$	0,4
Calibration Voltage				
Va = 1. Vrms into Line		= 2.5 V	ms on Tape	3 S. U cbs
Line Amplifier Settin	gs			
For Calibration G _c	= 01;	for Data G	d = 0 1	
Lab. Gain	Tape Mor	itor Gain T	$MG = \frac{Gd}{Gc} =$. /
LG =			MG - G _c =	/
Microphone Sensitivi	ty		deliterii iliiililililililililili era apuleisine <u>mparamamata ili era apuleisinemini</u>	
S = c - psi/Vol		rms = / (.	db SPL	
Equivalent of Calibra	tion - psi	,		
Pc = V . \$	=(0.5)	(0,290)	= 0 113	
Equivalent of Calibra	ition for PS	D Plots		
P_{c} 2	1.1	17-72	7 CO 10 3	0
$\frac{P_c}{(TMG)(LG)}$	L /x	1 = 2	. 1.4 % /	ps1 ² /cps
Analyzer Attenuator	Setting	Log(Converter Sett	ing
-70	db		0	lb
Calibration Plotteda	† 7.	C X 16 - 4		ps1 ² /cps
Overall Pressure Lev	el Data	Eq	uiv, to	db SPL
RMS pressure Level	(Pc)	(V _R)		
		LG)(V _c)		
*				
				psi

CALC RFS	f/1, de to REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	T sv
APR.)		OF MICROPHONE OUTPUT	UL 80084
APR			THE BOEING COMPANY	PAGE 12-1

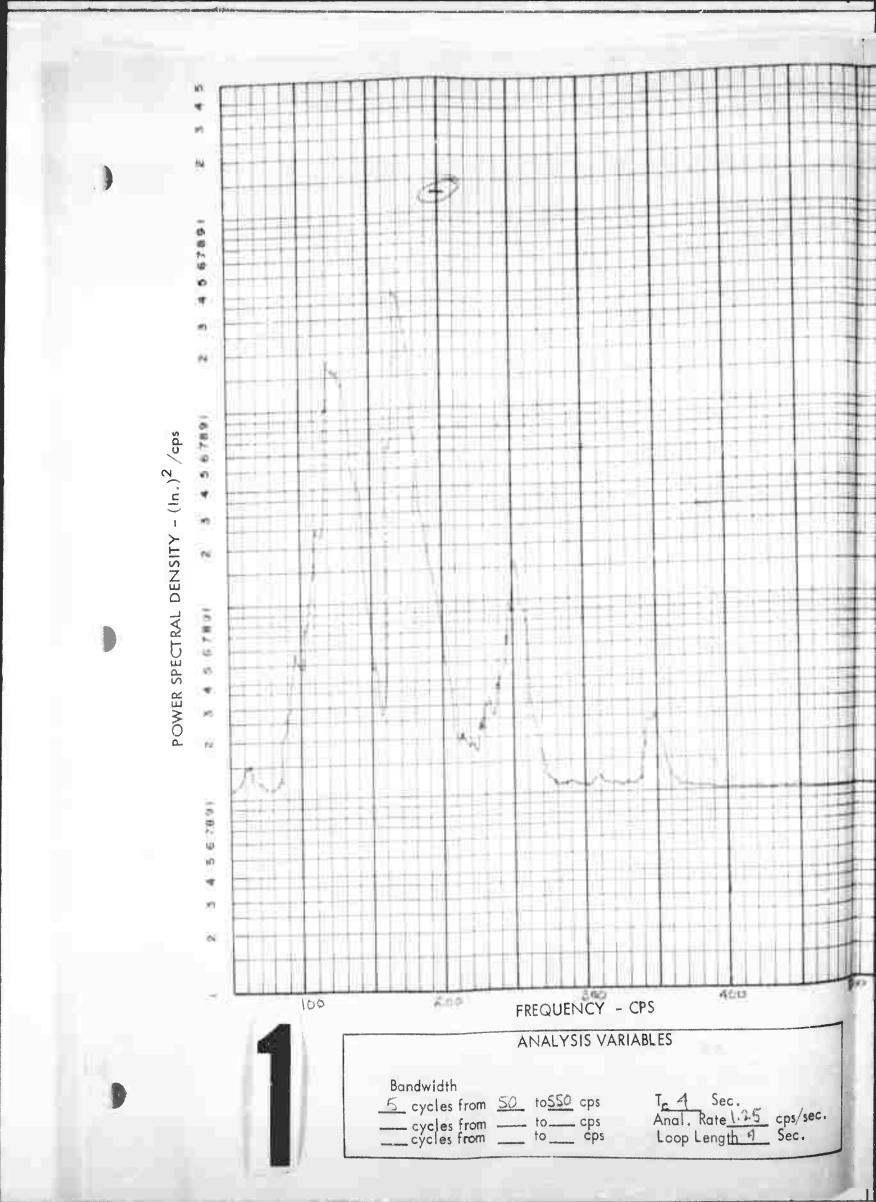


Test Title	TYPE	organia.	PK	PELIFY
EWA No. 5503-1	The state of the s	Panel	or Sp	pecimen No.
Tape No.	Tape Chann	nel 3		Mic. No.
Elapsed Test Time		Mic. VL =	RMS	Level at Sonic Lab. Volts

CA	LIBRATION		
Tape No. Tape	Channel	Data Tape RM	
16	1	$V_R = Q$	355
Calibration Voltage		V on Tone	D
$V_{a} = .5V_{rms}$ into Line Amp	; V _c = .5	on Tape	200 cps
Line Amplifier Settings			
For Calibration G _c =	; for Data	$G_{d} = \sqrt{2}$	
Lab. Gain LG =	Monitor Gain	$TMG = \frac{Gd}{G_C} =$	er e
Microphone Sensitivity		C	
S = 7 + 0 psi/Volt or 1	Volt ms =	160 db SPL	
Equivalent of Calibration -			
$P_c = V_a \cdot S = (.5)$	1 1, 2 (0)	a { A &	
Equivalent of Calibration	or PSD Plots		
P_{c} 2	.145	5. SX10-3	2
$\left(\frac{P_c}{(TMG)(LG)}\right)^2 = \left(\frac{P_c}{(TMG)(LG)}\right)^2$	to the approximation retired a trade-leagues receive derivate trade to the first trade tr		psi ² /cps
Analyzer Attenuator Settin	g Lo	g Converter Sett	ing
-7 11 db			db
Calibration Plottedat	7 , 12	,	ps1 ² /cps
Overall Pressure Level Dat	a	Equiv. to	db SPL
RMS pressure Level	(Pc) (VR)		
(T/	MG)(LG)(V _c)		
:		model' production	
			psi

SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

CALC	1-F3	94,663	REVISED	DATE	POWER SECTRAL DENSITY ANALYSIS	Va. I
CHECK	1.15				OF MICROPHONE OUTPUT	The state of
APR					1478 MICZ	PAGE
APR					THE BOEING COMPANY	F-4 171



PACE I		
TYPE "	I PR	E Lul M.
	Panel or	Specimen No.
Tape Char	nel	Displacement Pickup
	P/U RMS VL =	Level at Sonic Lab. Volts
	P/U RMS	
	-1	Tape Channel

Tape No. Tape Channel Data Tape RMS Volto $V_R = 8$.

Calibration Voltage $V_{a} = .5$ V_{ms} into Line Amp.; $V_{c} = .5$ V_{rms} on Tape 240 cps

Line Amplifier Settings
For Calibration $G_c = .$; for Data $G_d = .$

Displacement Pickup Sensitivity

S = .0708 in./Volt

Equivalent of Calibration - In.

 $D_c = V_a \cdot S = (.5)(.0708) \cdot .0354$

Equivalent of Calibration for PSD Plots

 $\left(\frac{D_c}{(TMG)(LG)}\right)^2 = \left[\frac{.0354}{1 \times 1}\right]^2 = 1.25 \times 10^{-2}$ in. ²/cp

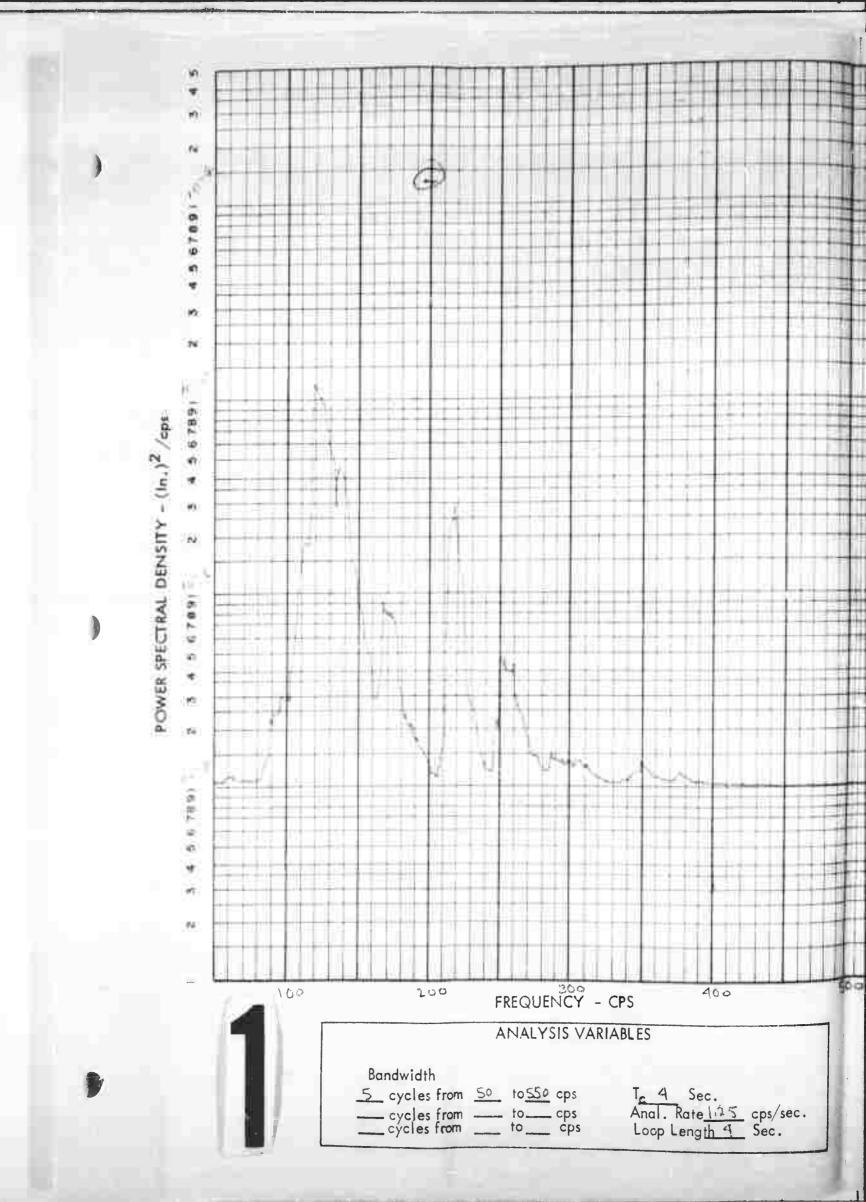
Analyzer Attenuator Setting Log Converter Setting db

Calibration Plotted at / 2 5 × 10 - 4 in. 2/cps

Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ = $(TMG)(LG)(V_c)$

psi

CALC	RAS	Thula 3 REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	V
CHECK	1405	10 - 3		OF DISPLACEMENT PICKUP	ACV T
APR.				1418 P/U 1	D2 80084
APR				THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 123



PANEL ATTACK			
EWA No.	2-1		pecimen No.
Tape No.	Tape Chai	5	Displacement Pickup 5
Elapsed Test Time		P/U RMS L VL =	evel at Sonic Lab. Volts

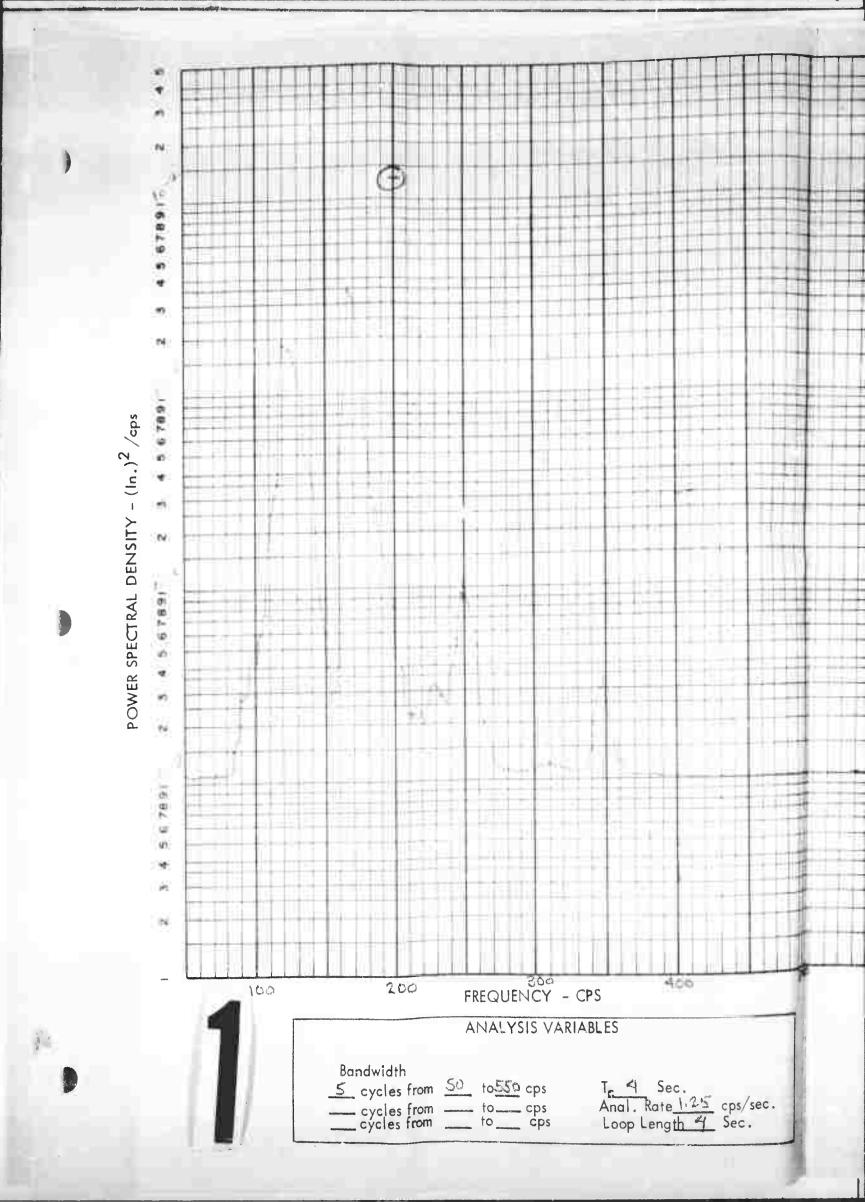
CALIBRATION

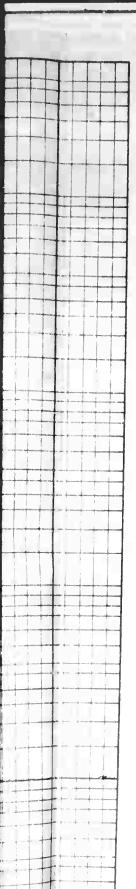
	CAL	IBRATION		
Tape No.	Tape Chai	nnel	Data Tape	MS Volt
16			$V_{R} = 0$.	175
Calibration Voltage				
$V_{q} = .5 V_{rms}$	Into Line A	$\text{Amp.; } V_{c} =$,5 ms	on Tape Zoo cps
Line Amplifier Setti	ngs .			
For Calibration	c = . \	; for Date	$a Gd = \sqrt{a}$	
Lab. Gain LG =	Tape Mon	itor Gain T/	MG = Gd =	
Displacement Pickup S = . 6709 in ./		у	Gc	
Equivalent of Calibr	ation – in.			
$D_c = V_a \cdot S =$	(5)(.	3708) =	P330.	
Equivalent of Calibr	ation for P	SD Plots		
$\left(\frac{D_c}{(TMG)(LG)}\right)^2 =$	- 0.5	S-1	1.25×10	in. ² /cps
Analyzer Attenuator	_			
-10	db		db	
Calibration Plotted		*	The second secon	2
en 4000ento aprilitativa della tetramina della tetramina della constituzioni della con	1000	X15-1		in. ² /cps
Overall Deflection I				
RMS Deft. Level				
	(TMG)(LC	(V_c)		ļ
				1

psi

2

CALC	RIC	9/12/24	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	
CHECK	ROS	10-63			OF DISPLACEMENT PICKUP	AOF T
APR.					1478 P/U 5	DZ-80084
APR					THE BUEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 12A

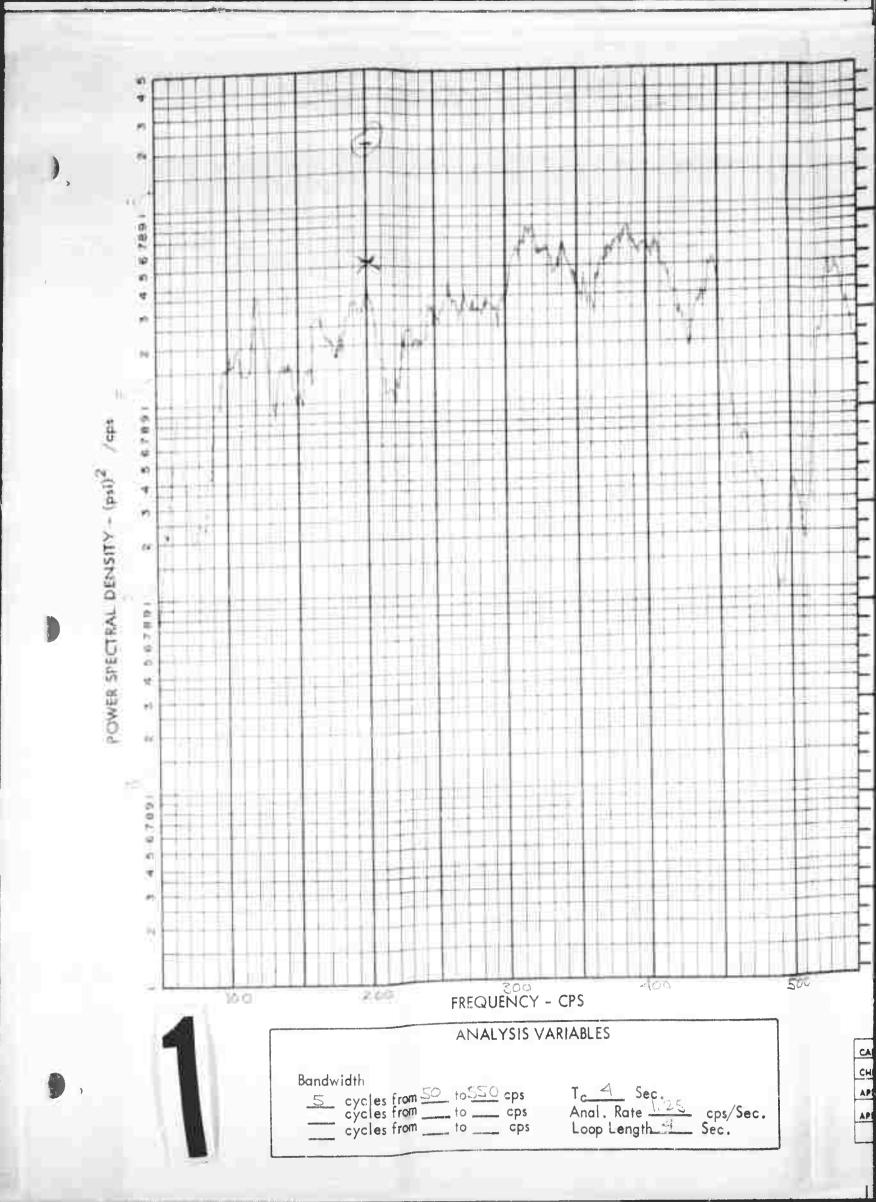




TYP	EIPI	RELIM.
atto.	Panel or S	pecimen No. 1478
Tape Chan	6	Displacement Pickup *
	P/U RMS L VL =	Level at Sonic Lab. Volts
	-	Tape Channel

CALIBRATION
Tape Channel Data Tape RMS Volt Tape No. VR = 0,260 16 Calibration Voltage Vg = 15 Vms Into Line Amp.; Vc = 15 Vms on Tape 20ccps Line Amplifier Settings For Calibration $G_c = .1$; for Data $G_d = .1$ Tape Monitor Gain TMG = Gd = Lab. Gain LG = Displacement Pickup Sensitivity S = .0708 in./Volt Equivalent of Calibration - in. $D_c = V_a \cdot S = (.5)(.0708) \cdot .0354$ Equivalent of Calibration for PSD Plots [.0354] - 1,25 × 10-3 in. 2/cps (TMG)(LG) Log Converter Setting Analyzer Attenuator Setting Calibration Plotted at in. 2/cps Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(V_c) psi

CHECK PL S	9/26/23	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS OF DISPLACEMENT PICKUP	VOLI
APR.				1478 P/U 6	02-80084
APR.			a ya wangi tangihani da kakata da kata da ka	THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 125



				SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)
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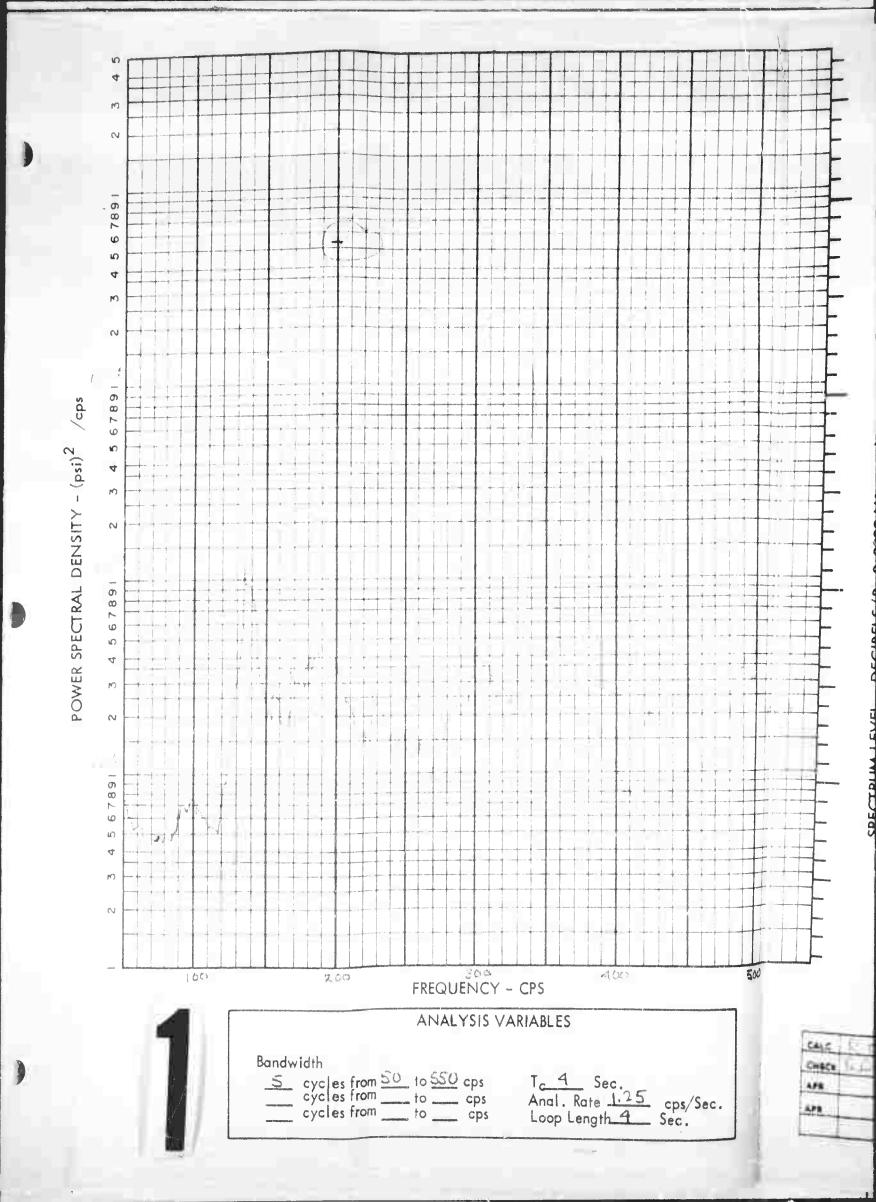
	DATA II	DENTIFICA	TION	
Test Title				
PANEL ATTACK	TYPE	Jun 1		
ENA INO.	1	Panel or S	pecimen No.	
559:1		14"		
Tape No.	Tape Chan	nel	Mic. No.	
(")	2		1	
Elapsed Test Time		Mic. RMS	Level at Sonic Lab.	
1		V _L =	Volts	

CALIBRATION Data Tape RMS Volt VR = 0 41 (5 Tape Channel Tape No. Calibration Voltage V_{rms} on Tape @ AC cps Va = .5 Vrms into Line Amp.; Vc = .5 Line Amplifier Settings Ine Amplifier Settings
For Calibration $G_c = \frac{1}{2}$; for Data $G_d = \frac{1}{2}$ ab. Gain

Tape Monitor Gain

TMG = $\frac{G_d}{G_c}$ = Lab. Gain Microphone Sensitivity S = 30psi/Volt or 1 Volt rms = 160 db SPL Equivalent of Calibration for PSD Plots (TMG) (LG) Log Converter Setting Analyzer Attenuator Setting psi²/cps Calibration Plotted at Overall Pressure Level Data
(Pc) (VR) Equiv. to db SPL (TMG)(LG)(Vc) psi

CALC	7.1.	REVISED	DATE	DOWER CRECTRAL DENIGITY ANIALYCIC	1 - 1
CHECK CAL	11			POWER SPECTRAL DENSITY ANALYSIS	AC==7
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APR				THE BOEING COMPANY	F14 126



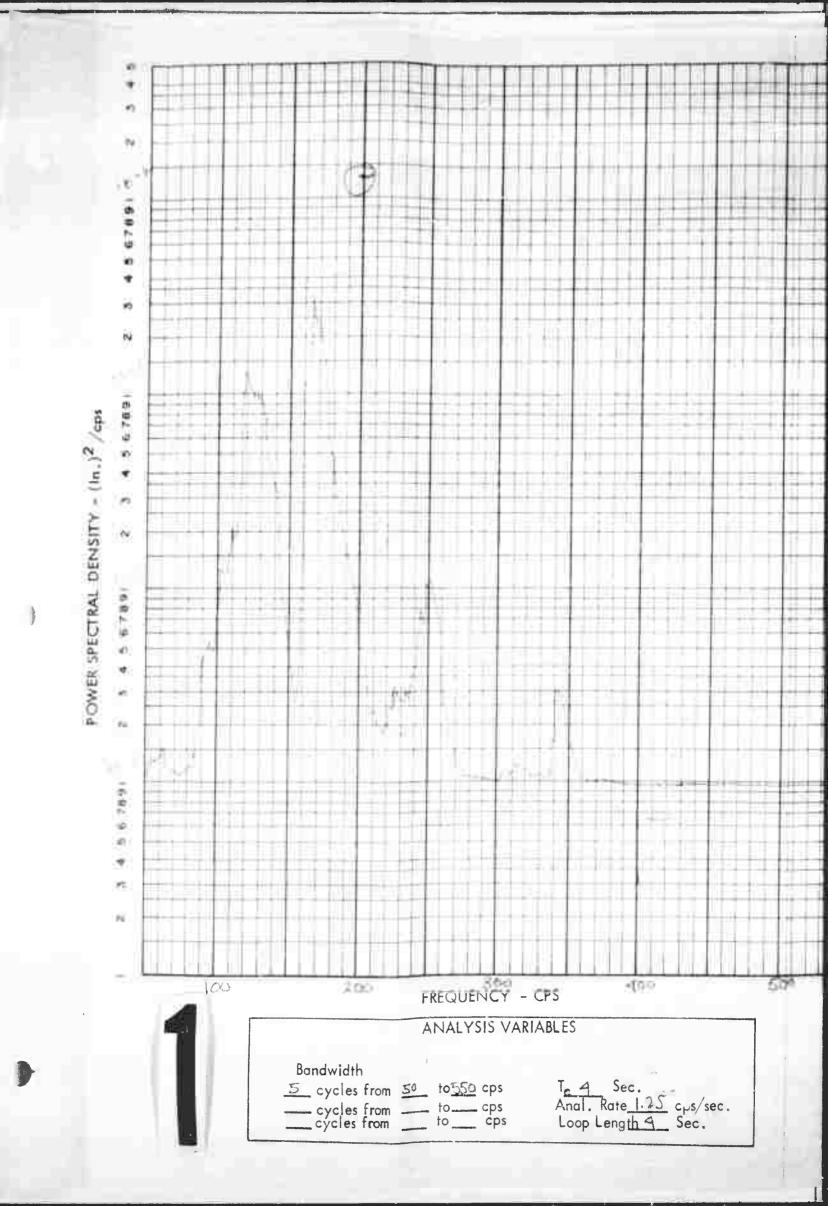
SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

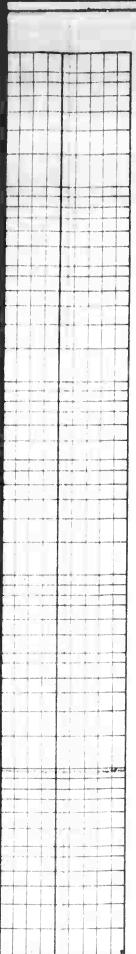
	DATA I	DENTIF	-ICA	TION	
Test Title					
EWA No. 5502 -1	7	Panel	or Sp	pecimen No.	
	Tape Chang	nel		Mic. No.	
Elapsed Test Time		Mic. VL =	RMS	Level at Sonic Lab. Volts	
					-

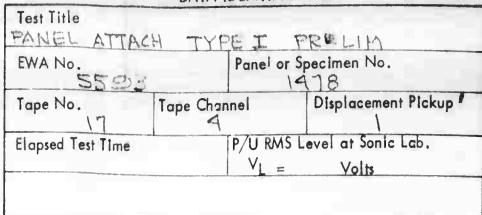
CALIBRATION Data Tape RMS Volt VR = 0.3.90 Tape No. Tape Channel Calibration Voltage Va = 5 Vrms into Line Amp.; Vc = 15 Vrms on Tape @ 200 cps Line Amplifier Settings Tape Monitor Gain TMG = $\frac{G_d}{G_c}$ = 2 For Calibration G_C = Lab. Gain LG = Microphone Sensitivity S = 290 psi/Volt or 1 Volt rms = 160 db SPL Equivalent of Calibration - psi Pc = Va · S = , Sit, 245 , 145 Equivalent of Calibration for PSD Plots

Pc 2 145 5.6 410 5.7 (TMG) (LG) (TMG) (LG) Analyzer Attenuaror Setting Log Converter Setting ps1²/cps 5.26 ×107 Calibration Plotted at Overall Pressure Level Data (Pc) (VR) Equiv. to db SPL RMS pressure Level (TMG)(LG)(V_c) psi

CALC C	10/ 10	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	
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MI.				THE BOEING COMPANY	PAGE

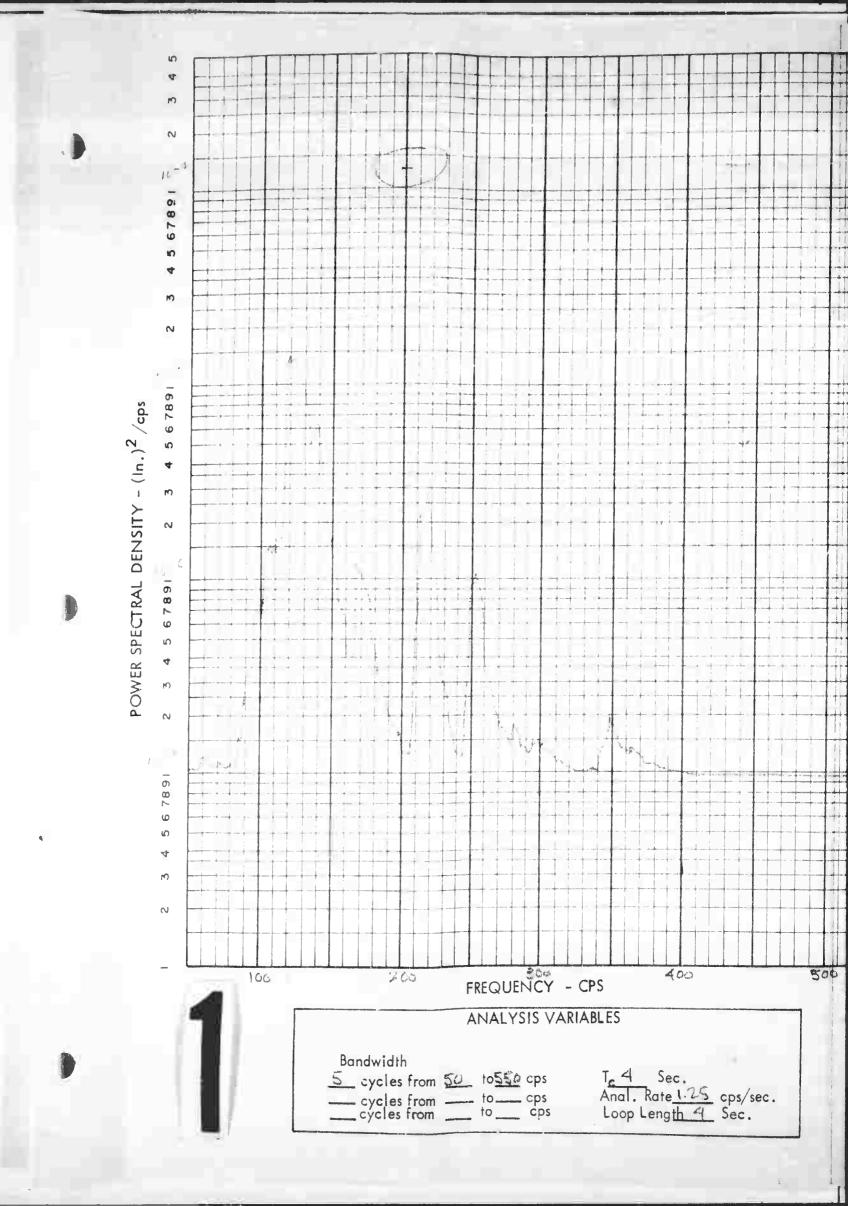






CALIBRATION Data Tape RMS Volt Tape Channel Tape No. VR = . 26 > Calibration Voltage $V_{q} = 5$ V_{rms} Into Line Amp.; $V_{c} = 5$ V_{rms} on Tape 200ps Line Amplifier Settings For Calibration $G_c = .$; for Data $G_d = .$ Lab. Gain Tape Monitor Gain TMG = Gd = LG = Displacement Pickup Sensitivity S = .0708 In./Volt Equivalent of Calibration - in. $D_c = V_a \cdot S = (.5) \cdot (.5) \cdot (.5) \cdot (.5)$ Equivalent of Calibration for PSD Plots $\left(\frac{D_c}{(TMG)(LG)}\right)^2 = \left[\frac{0.351}{(1.01)}\right] = 1.25 \times 10^{-2} \text{ in.}^{2/cps}$ (TMG)(LG) Analyzer Attenuator Setting Log Converter Setting - 10 db Calibration Plotted at $\ln \frac{2}{cps}$ Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ $(TMG)(LG)(V_c)$ psi

CALC RFG	1/26/6. REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	Voci
CHECK 14 1	10-63		OF DISPLACEMENT PICKUP	
APR.			1478 P/U 1	05-80084
APR.			THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 128

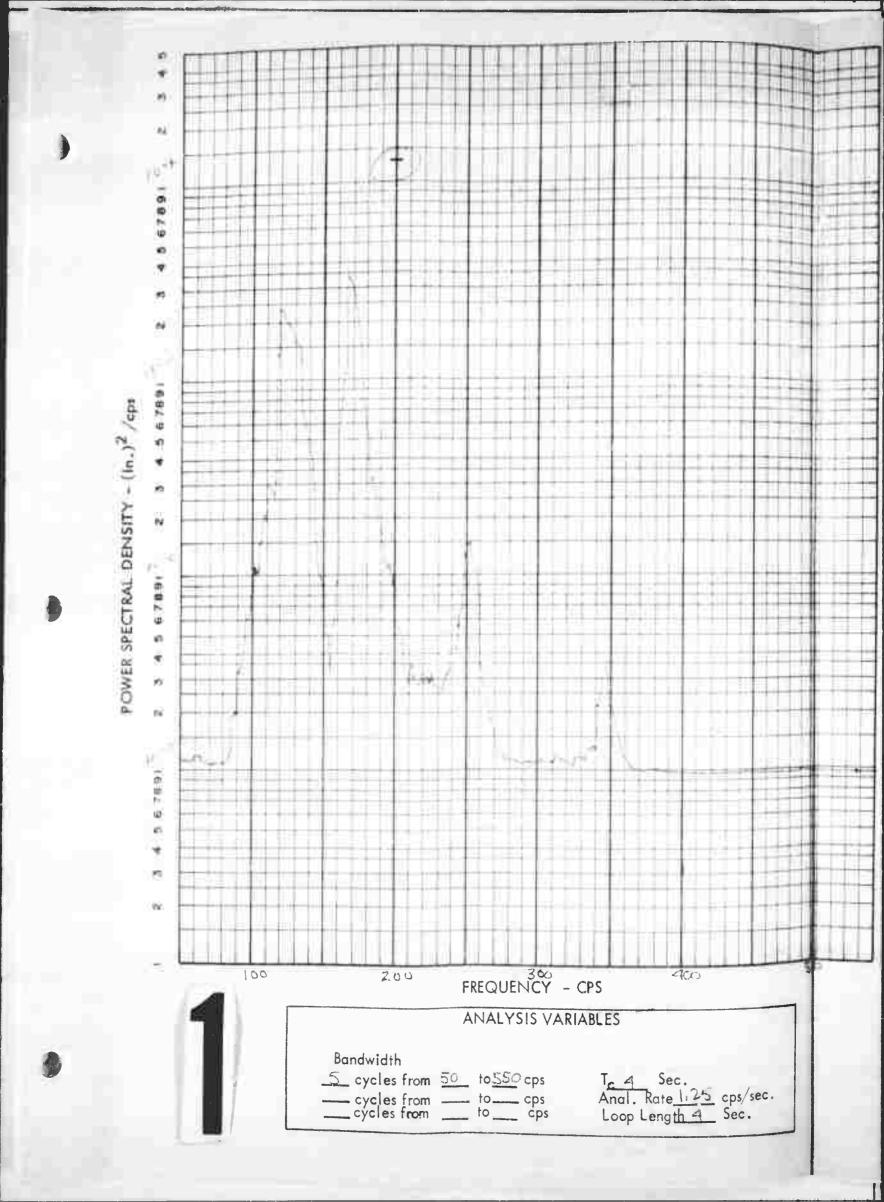


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Test Title PANEL ATTA	"IJ TYE	ET P	PELIM
EWA No. 5593-1		Panel or Sp	pecimen No.
Tape No.	Tape Chan		Displacement Pickup 5
Elapsed Test Time		P/U RMS L	evel at Sonic Lab. Volts

CALIBRATION Data Tape RMS Volt Tape No. Tape Channel 1-1 VR = 0,197 Calibration Voltage $V_{q} = .5$ V_{rms} into Line Amp.; $V_{c} = .5$ V_{rms} on Tape 2000cps Line Amplifier Settings For Calibration $G_c = ...$; for Data $G_d = ...$ Lab. Gain \ Tape Monitor Gain TMG = Gd = LG = Displacement Pickup Sensitivity S = .0708 In./Volt Equivalent of Calibration - In. $D_c = V_a \cdot S = (.S) (.5108)$ 0:54 Equivalent of Calibration for PSD Plots in. 2/cps Analyzer Attenuator Setting Log Converter Setting -10 db Calibration Plotted at 1.22 × 1004 in.²/cps Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(Vc) psi

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CALC RES	9/20/6 REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	Vol I
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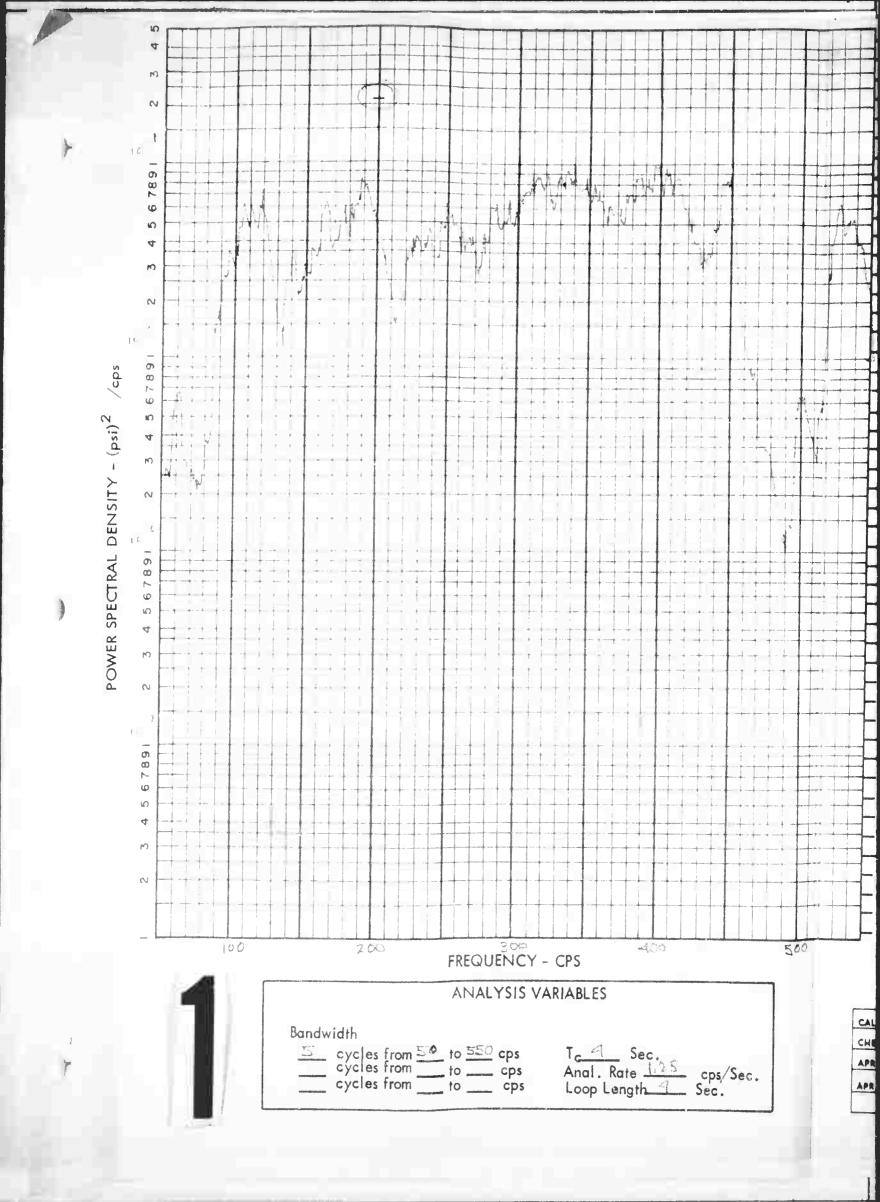
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Test Title		
PANEL ATT	ICH TYPE "	I PRELIM
EWA No. 55 93		Specimen No.
		1478
Tape No.	Tape Channel	Displacement Pickup
	6	G
Elapsed Test Time	P/U RMS	S Level at Sonic Lab.
	V_ =	Volts
,		

CALIBRATION Data Tape RMS Volt Tape Channel Tape No. $V_{R} = .285$ Calibration Voltage $V_{q} = .5$ V_{rms} Into Line Amp.; $V_{c} = .5$ V_{rms} on Tape 200cps Line Amplifier Settings
For Calibration $G_c = .$; for Data $G_d = .$ Tape Monitor Gain TMG = $\frac{G_d}{G_c}$ = Lab. Gain LG = Displacement Pickup Sensitivity S = .0708 in,/Volt Equivalent of Calibration - in. $D_c = V_a \cdot S = (.5)(.0708) - .0254$ $\frac{\Gamma_{\text{quivalent of Calibration for PSD Plots}}{\left(\frac{D_{\text{c}}}{(\text{TMG})(\text{LG})}\right)^2} = \frac{\left[\frac{0.254}{1\times1}\right]^2}{\left[\frac{1}{1\times1}\right]^2} = 1.25\times10^{-3}$ in. 2/cps (TMG)(LG) Analyzer Attenuaior Setting Log Converter Setting Calibration Plotted at In. 2/cps Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ $\frac{(-c/(VR))}{(TMG)(LG)(V_c)} =$ psi

2

sec.

CALC FEE	ALL REVISED	OF DISPLACEMENT PICKUP	YSIS VOL I
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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

DATA IDENTIFICATION

TION
PRELIM pecimen No.
Mic. No.
Level at Sonic Lab. Volts

CALIBRATION

Tape No. Tape Channel Data Tape RMS Voit $V_R = 1.5$ Calibration Voltage $V_a = .5 V_{rms}$ into Line Amp.; $V_c = .5 V_{rms}$ on Tape $0.5 V_{$	s							
Calibration Voltage $V_a = .5 V_{rms}$ into Line Amp.; $V_c = .5 V_{rms}$ on Tape $@_{200}$ cps. Line Amplifier Settings For Calibration $G_c = .1$; for Data $G_d = .1$. Lab. Gain Tape Monitor Gain TMG = $\frac{G_d}{G_c} = 1$. Microphone Sensitivity $S = .7.90 \text{psi} / \text{Volt mns} = 160 \text{db SPL}$. Equivalent of Calibration - psi $P_c = V_a \cdot S = (.5) \cdot (.2.90) \cdot (.2.90) \cdot (.4.5)$. Equivalent of Calibration for PSD Plots $V_c = V_c \cdot S \cdot (.2.90) \cdot$	S							
Calibration Voltage $V_{a} = .5 V_{rms} \text{ into Line Amp.; } V_{c} = .5 V_{rms} \text{ on Tape } @_{200} \text{ cps}$ $Line Amplifier Settings \\ For Calibration G_{c} = .1 ; \text{ for Data } G_{d} = .1 Lab. Gain \\ LG = 1 Tape Monitor Gain TMG = \frac{G_{d}}{G_{c}} = 1 Microphone Sensitivity \\ S = .7.90 psi/Volt \text{ or 1 Volt rms} = 160 db SPL Equivalent of Calibration - psi \\ P_{c} = V_{a} \cdot S = (.5) \cdot (.2.90)145 Equivalent of Calibration for PSD Plots \\ \left(\frac{P_{c}}{(TMG)(LG)}\right)^{2} = \frac{1.10 \times 10^{-2}}{1.10 \times 10^{-2}} = \frac{2.10 \times 10^{-2}}{1.10 \times 10^{-2}} = \frac{1.10 \times 10^{-2}}{1.10 \times 10^{-2}} = \frac$	s							
Line Amplifier Settings For Calibration $G_c =$; for Data $G_d =$ Lab. Gain	S							
For Calibration $G_c = .$; for Data $G_d = .$ Lab. Gain LG = \text{Tape Monitor Gain TMG} = $\frac{G_d}{G_c} = 1$ Microphone Sensitivity $S = .7.90 \text{psi/Volt or 1 Volt rms} = .160 \text{ db SPL}$ Equivalent of Calibration - psi $P_c = V_a \cdot S = (.5)(.2.90) \cdot \cdot .45$ Equivalent of Calibration for PSD Plots $\left(\frac{P_c}{(\text{TMG})(\text{LG})}\right)^2 = \left[\frac{ \cdot \cdot \cdot \cdot}{ \cdot \cdot \cdot \cdot}\right] = 2.10 \times 10^{-2} \cdot \cdot \cdot \cdot$								
Lab. Gain LG = Tape Monitor Gain TMG = $\frac{G_d}{G_c}$ = Microphone Sensitivity S = 790psi/Volt or 1 Volt mms = 160 db SPL Equivalent of Calibration - psi P _c = V _a · S = (.5) (.2.90)145 Equivalent of Calibration for PSD Plots $\frac{P_c}{(TMG)(LG)}$ $\frac{P_c}{(TMG)(LG$								
Microphone Sensitivity $S = 790 \text{psi/Volt or 1 Volt rms} = 160 \text{db SPL}$ Equivalent of Calibration - psi $P_{c} = V_{a} \cdot S = (.5)(.2.90) \cdot \cdot$								
Microphone Sensitivity $S = .790 \text{psi/Volt or 1 Volt rms} = .60 \text{ db SPL}$ Equivalent of Calibration - psi $P_c = V_a \cdot S = (.5)(.2.90) \cdot .145$ Equivalent of Calibration for PSD Plots $\left(\frac{P_c}{(\text{TMG})(\text{LG})}\right)^2 = \left[\frac{.145}{.145}\right]^2 = 2.10 \times 10^{-2} \text{ psi}^2/\text{cp}$								
$S = .780 \text{psi/Volt or 1 Volt rms} = .160 \text{ db SPL}$ Equivalent of Calibration - psi $P_{c} = V_{a} \cdot S = (.5)(.280) \cdot .145$ Equivalent of Calibration for PSD Plots $\left(\frac{P_{c}}{(\text{TMG})(\text{LG})}\right)^{2} \cdot \left[\frac{.145}{.145}\right]^{2} = 2.10 \times 10^{-7} \text{ psi}^{2}/\text{cp}$								
$\frac{P_{c} = V_{a} \cdot V_{a} \cdot V_{c}}{\text{Equivalent of Calibration for PSD Plots}} = \frac{P_{c}}{(TMG)(LG)} = \frac{V_{a} \cdot V_{c}}{V_{c} \cdot V_{c}} = \frac{V_{c} \cdot V_{c}}{V_{c}} = \frac{V_{c} \cdot V_{c}}{V_$								
$\frac{P_{c} = V_{a} \cdot V_{a} \cdot V_{c}}{\text{Equivalent of Calibration for PSD Plots}} = \frac{P_{c}}{(TMG)(LG)} = \frac{V_{a} \cdot V_{c}}{V_{c} \cdot V_{c}} = \frac{V_{c} \cdot V_{c}}{V_{c}} = \frac{V_{c} \cdot V_{c}}{V_{c} \cdot V_{c}} = \frac{V_{c} \cdot V_{c}}{V_{c}} = \frac{V_{c}$								
$\left(\frac{P_c}{(TMG)(LG)}\right)^2 = \left[\frac{.\sqrt{45}}{1\times1}\right]^2 = \frac{2.10\times10^{-2}}{psi^2/cp}$								
$\left(\frac{P_c}{(TMG)(LG)}\right)^2 = \left[\frac{1}{1}\sqrt{4\pi}\right]^2 = \frac{7.10\times10^{-2}}{psi^2/cp}$ Analyzer Attenuator Setting								
(TMG) (LG) psi ² /cp Analyzer Attenuate Setting Log Converter Setting	Pc /2 [.14= 7] - 710×10-3							
Analyzer Attenuator Setting Log Converter Setting	os							
and								
- 5 O dp dp								
Calibration Plotted at psi ² /cps Overall Pressure Level Data Equiv. to db St RMS pressure Level (Pc) (VR)	S							
Overall Pressure Level Data Equiv. to db St	2							
RMS pressure Level (Pc) (VR)								
$(TMG)(LG)(V_c)$								
in die to die yeb-opportunitelektrien verspaansgebreite bereitgeven der stellen opportunitelektrien geschaften.								
psi								

CALC RES GOVERNMENT POWER SPECTRAL DENSITY ANALYSIS VOLT.

OF MICROPHONE OUTPUT

D2-80084

THE BOEING COMPANY

PAGE
FIG. 131

ťΫ 6.783 POWER SPECTRAL DENSITY - (psi)² /cps 88788 17 100 160 2,00 FREQUENCY - CPS ANALYSIS VARIABLES Bandwidth 5 cycles from 50 to 550 cps cycles from to cps cycles from to cps T_c 4 Sec.
Anal. Rate 1.25 cps/Sec.
Loop Length 4 Sec.

DATA	IDEN	ITIFI	CAT	ION

Test Title PAMEL ATTIKE	7415	45.4	FR	E-11M	
EWA No.		Panel	or Sp	pecimen No.	
5695-1			19		
Tape No.	Tape Chan	nel		Mic. No.	
18	3			L	
Elapsed Test Time		Mic.	RMS	Level at Sonic Lab.	
		۳ یا۷		Volts	

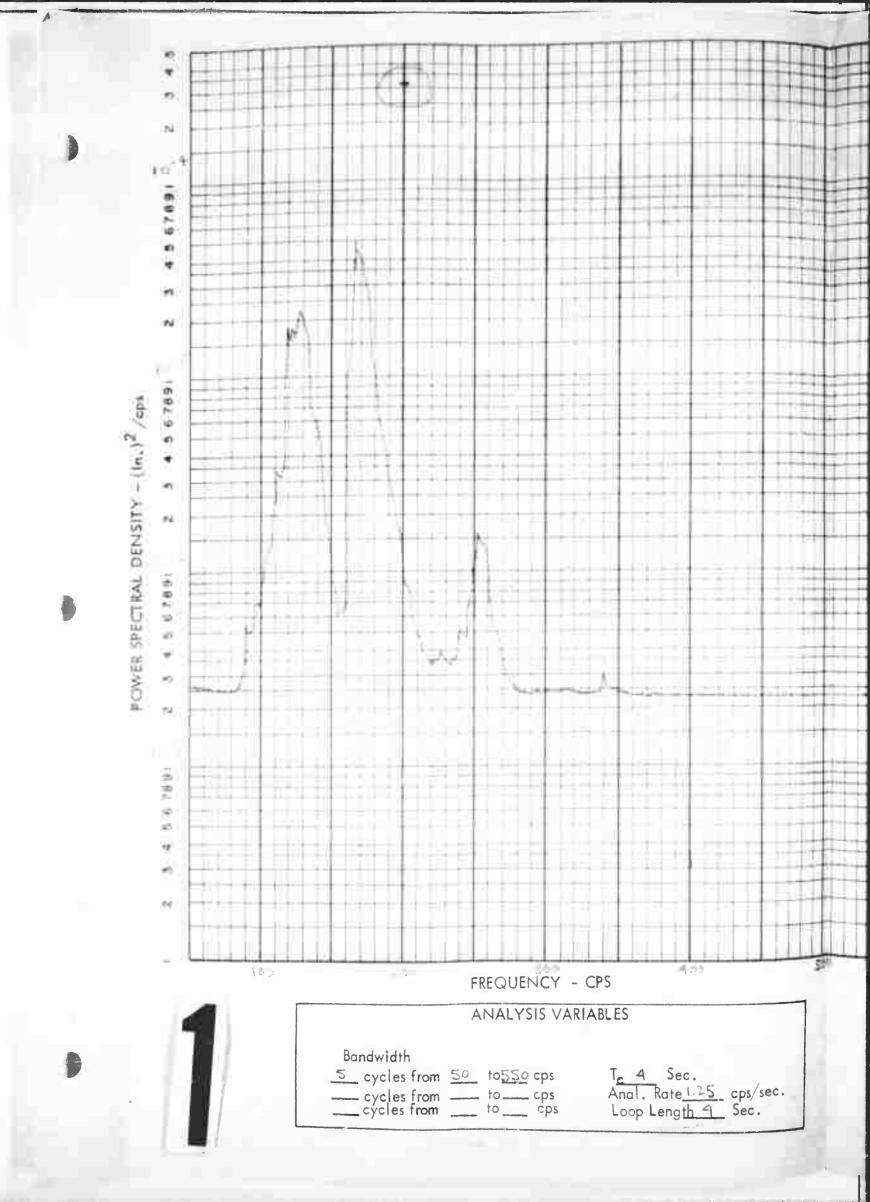
CALIBRATION

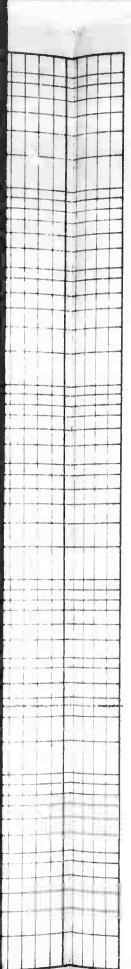
	CALIBRATION	
Tape No.	Tane Channel	Data Tape RMS Volt VR = 0 445
Calibration Voltage		T
Va = 5 Vrms into Line	Amp.; $V_c = .5$	rms on Tape © cps
Line Amplifier Settin For Calibration G _c	for Data (3d =
Lab. Gain LG =	Tape Monitor Gain	$TMG = \frac{G_d}{G_c} = \sum_{i=1}^{n}$
Microphone Sensitivi	ty	
	tor 1 Volt ms =	
Equivalent of Calibra Pc = V S	ition - psi	.195
Equivalent of Calibra	ation for PSD Plots	
$\left(\frac{P_c}{(TMG)(LG)}\right)^2$	[:145]	ps1 ² /cps
Analyzer Attenuator	Setting Log	Converter Setting
	db	db
Calibration Plotted	at .	ps1 ² /cps
Overall Pressure Lev	el Data	quiv. to db SPL
RMS pressure Level	$\frac{(P_c)(V_R)}{(TMG)(LG)(V_c)}$	
que sibre		voide scholp
		psl

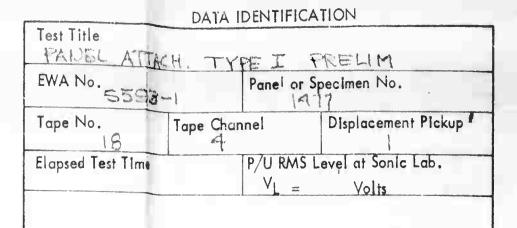
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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

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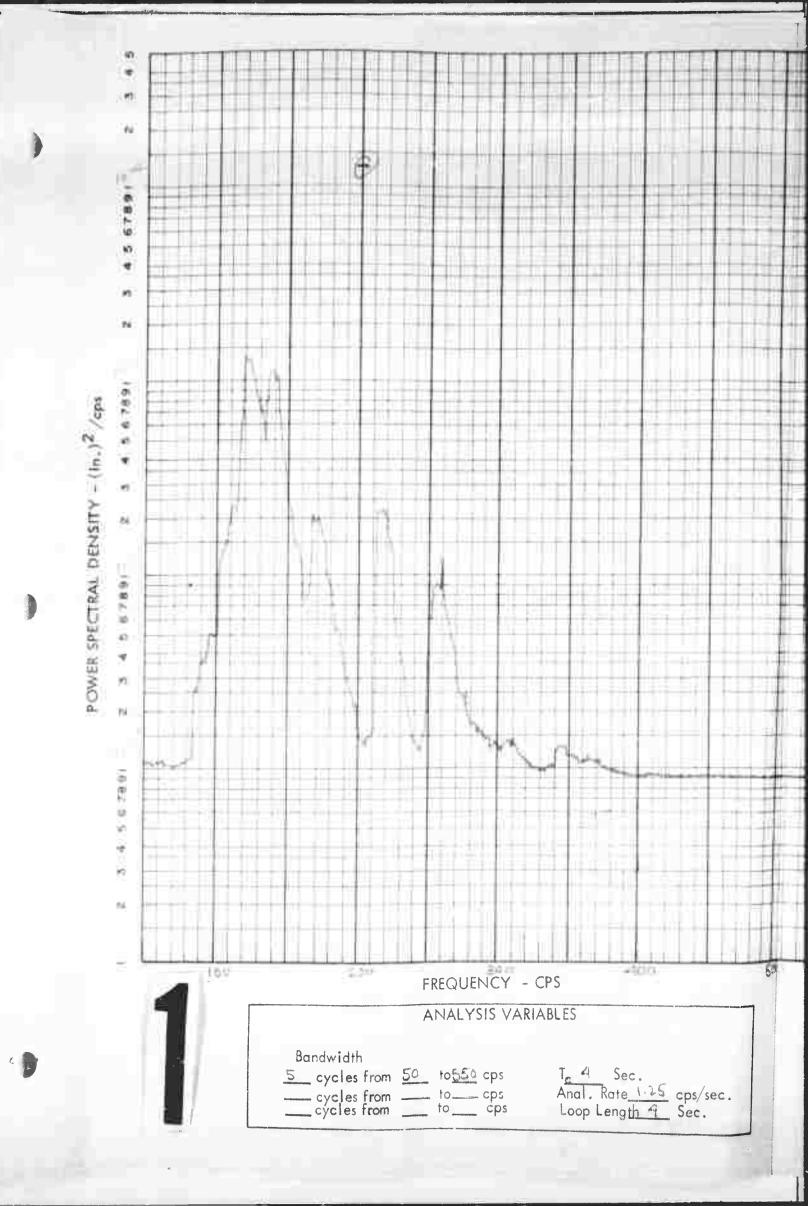




CALIBRATION

Channel Data Tape RMS Volt Tape Channel Tape No. VR=0500 Calibration Voltage Va = .5 Vms Into Line Amp.; Vc = .5 Vms on Tape 200cps Line Amplifier Settings For Calibration $G_c = 1$; for Data $G_d = 1$ Tape Monitor Gain TMG = Gd = 2 Lab. Gain LG = ____ Displacement Pickup Sensitivity S = 0708 In./Volt Equivalent of Callbration - in. $D_{c} = V_{a} \cdot S = (.5)(.030\%)$, 0.554 Equivalent of Calibration for PSD Plots 1-065- - 3.14x10-4 (TMG)(LG) Analyzer Attenuator Setting Log Converter Setting db Calibration Plotted at $\ln \frac{2}{cps}$ Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(Vc) psi

CALC	RES	11 16 BEV	ISED DATE	POWER SPECTRAL DENSITY ANALYSIS OF DISPLACEMENT PICKUP .	VOLI
CHECK APR.	KD 5	10.7.3		1477 P/U 1	D2-80084
APR				THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 133

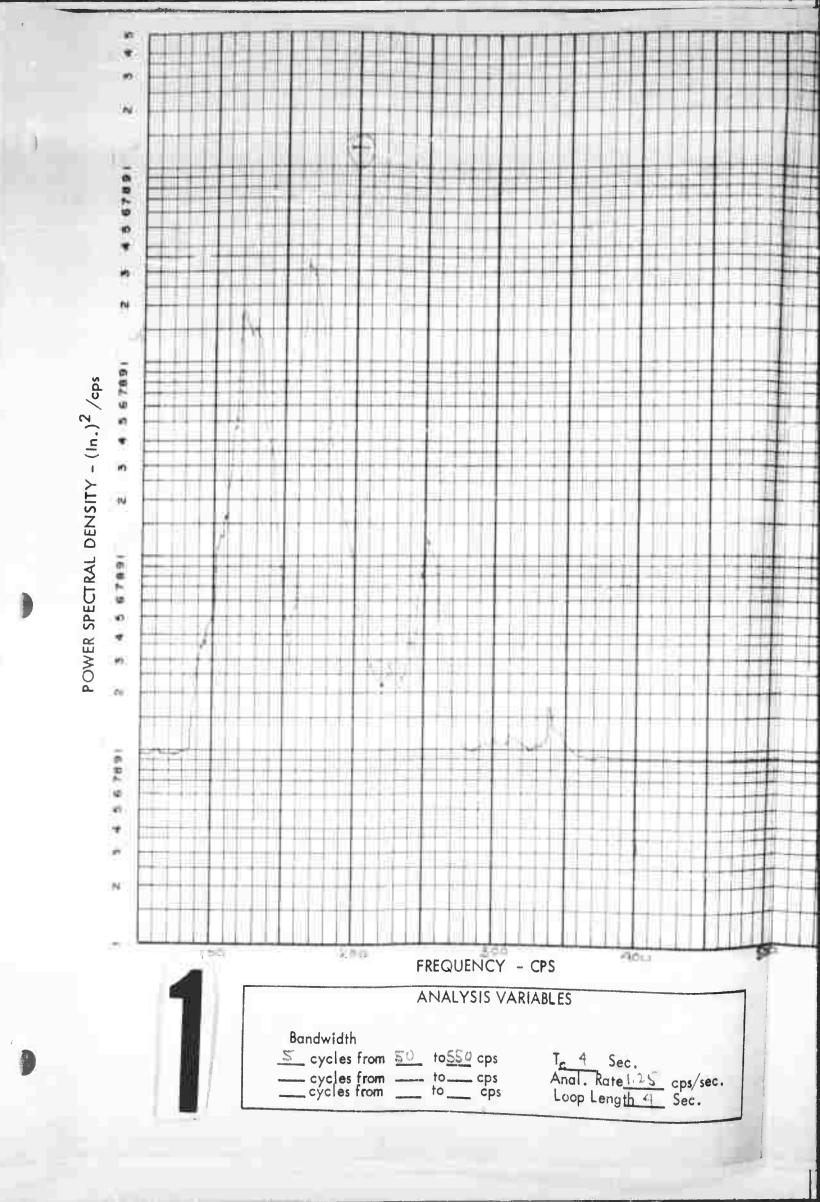


DATA IDENTIFICATION

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The second secon
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No.
ement Pickup
onic Lab.

CALIBRATION Data Tape RMS Volt Tape Channel Tape No. $V_R = -$ Calibration Voltage $V_{a} = .5 V_{mms}$ into Line Amp.; $V_{c} = .5 V_{mms}$ on Tape 200cps Line Amplifier Settings For Calibration $G_c = 1$; for Data $G_d = 1$ Lab. Gain Tape Monitor Gain TMG = $G_d = 1$ LG = 1 Displacement Pickup Sensitivity S = .0709 in./Volt Equivalent of Calibration - In. Equivalent of Calibration for PSD Plots in. 2/cps (TMG)(LG) Log Converter Setting Analyzer Attenuator Setting -/C db Calibration Plotted at 117 2 8 4 . $\ln \frac{2}{cps}$ Overall Deflection Level of Data RMS Defl. Level = $(D_c)(VR)$ $(TMG)(LG)(V_c)$ psi

CALC FE TO THE REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	Van T
CHECK PLO 10-2-3	Parties to the spacetons of the	OF DISPLACEMENT PICKUP	V C/C 1
APR.	Marini deliminari	1477 P105	DS-86 084
APR	B	THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG 34

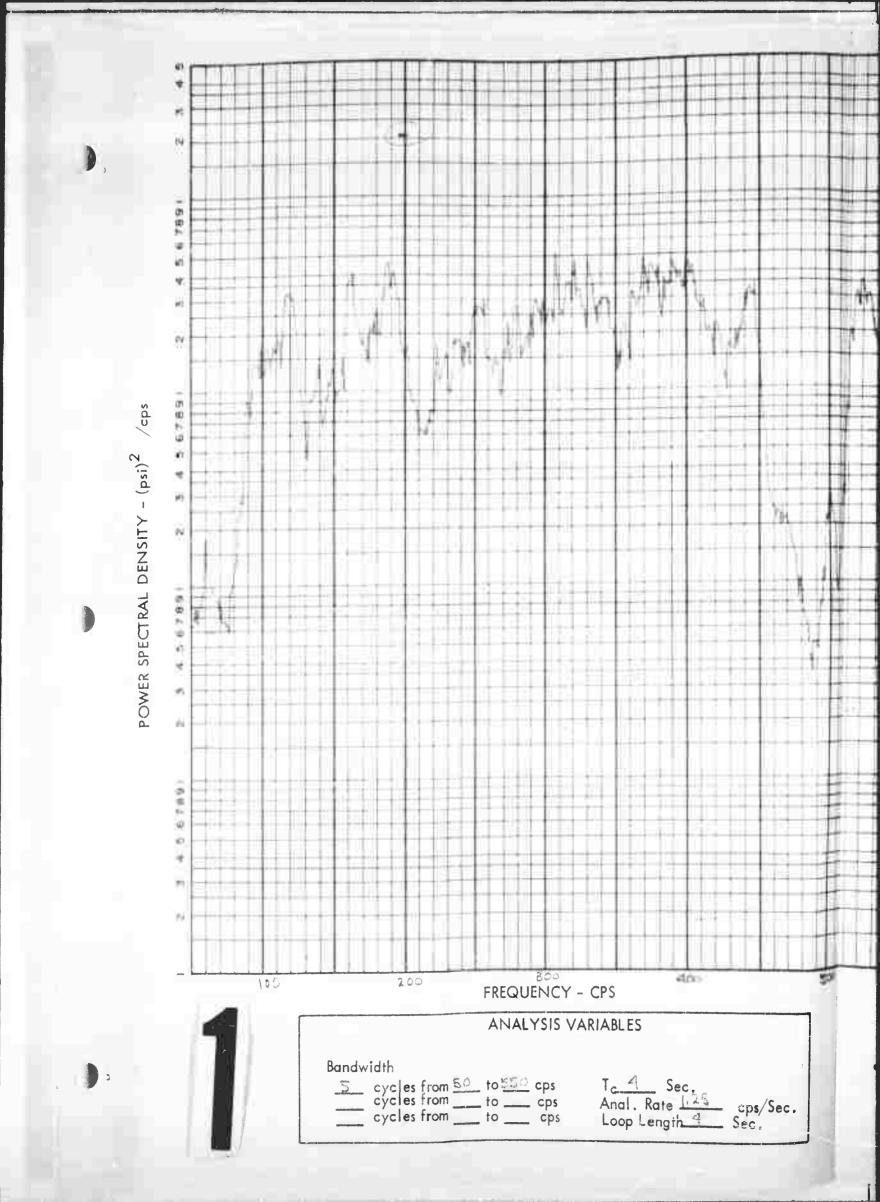




EWA No. 5593		Panel or	Specimen No.
Tape Na.	Tape Chan	nel	Displacement Pickup
Elapsed Test Time		P/U RMS	Level at Sonic Lab. Volts

CALIBRATION Tape Channel Data Tape RMS Volt Tape No. $V_R =$ Calibration Voltage $V_{a} = .5$ V_{rms} Into Line Amp.; $V_{c} = .5$ V_{rms} on Tape 200 cps Line Amplifier Settings For Calibration $G_c = \{G_d = G_d =$ Lab. Gain Tape Monitor Gain TMG = Gd = LG = Displacement Pickup Sensitivity \$ =.0708 In./Volt Equivalent of Calibration - In. $D_{c} = V_{a} \cdot S = (.5)(.0) \cdot \cdots = ... \quad ... \quad$ Equivalent of Calibration for PSD Plots (TMG)(LG) Analyzer Attenuator Setting Log Converter Setting Calibration Plotted at $in.^2/cps$ Overall Deflection Level of Data RMS Defl. Level = $(D_c)(VR)$ (TMG)(LG)(Vc) psi

CALC	KI		REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	113. 7
CHECK	RUS	10 1-3			OF DISPLACEMENT PICKUP	VOLI
APR.					1477 P/W 6	D2-80084
APR.					THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE 135



SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

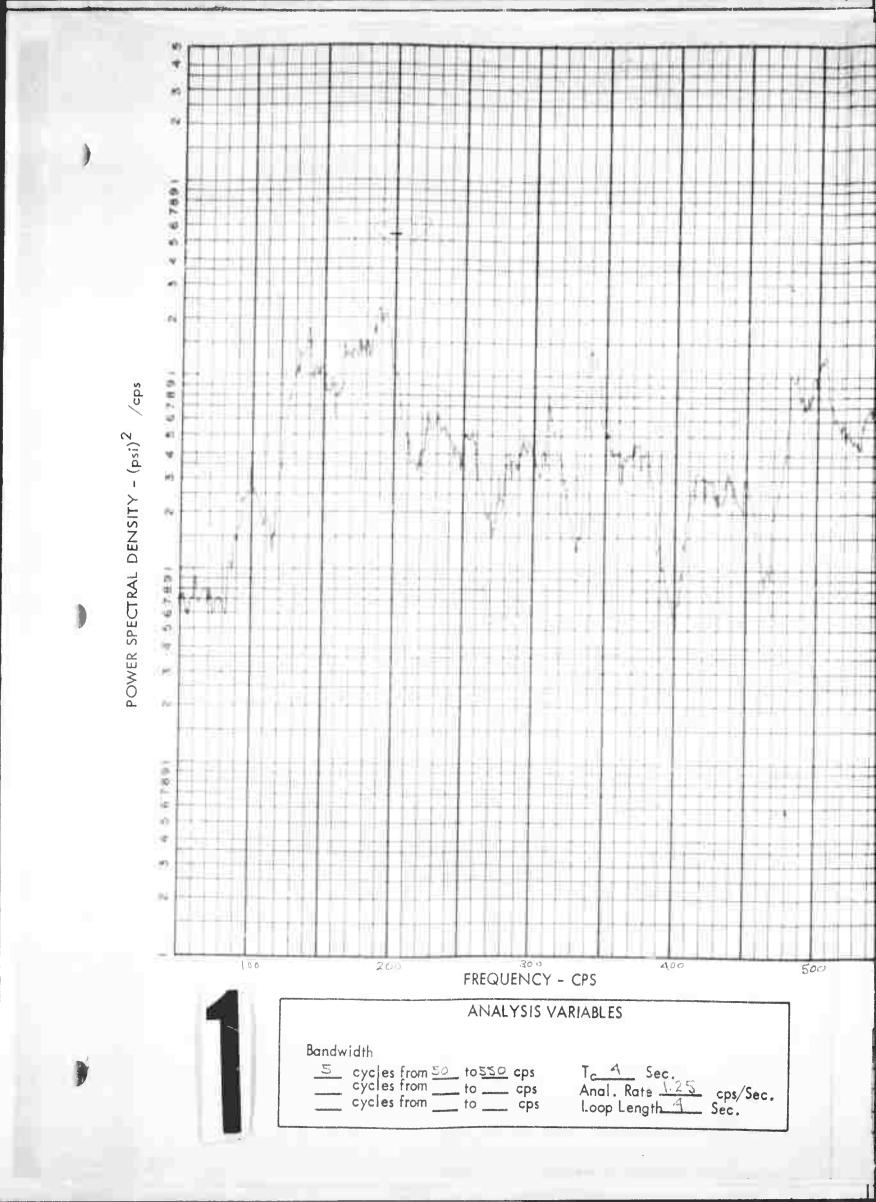
DATA IDENTIFICATION

Test Title PANEL ATTACH TYPE I PRELIM								
EWA No. 5555 1		Panel	or Sp	pecimen No.				
Tape No.	Tape Chann	el		Mic. No.				
Elapsed Test Time		Mic. VL =	RMS	Level at Sonic Lab. Volts				
The state of the s	актомати-тиковатична под достойно догодой дого							

CALIBRATION

	CALIBR	ALION		والشناف المساور
Tape No.	Tape Chan	nel	Data Tape RM	S Volt
15			V _R =	p
Calibration Voltage	**************************************		on Ione @	
$V_{a} = .5V_{\rm rms}$ into Lin	e Amp.; Vc	= 2 A	rms on Tape	ALC CPS
Line Amplifier Setting	าตร			
For Calibration G	c = · \ ;	for Data G	d = .	
Lab. Gain	Tape Mon	itor Gain T	$MG = \frac{Gd}{G} =$	1
LG			Gc	
Microphone Sensitiv	ity		(2)	
S = 100 psi/V	olt or 1 Volt	mns = \	db SPL	
Equivalent of Calibration P _C = V _a · S	ation - psi	*	1416	
			\$ \ and	•
Equivalent of Calib				
P _c /2	. 14.	= 2,	10 x .0"-	12/
(TMG) (LG)		= 2,		ps1 ² /cps
Analyzer Attenuato	r Setting	Log	Converter Sett	
				b
Calibration Plotted	at			ps1 ² /cps
			gauge-rayprandishilikysinysingige na asalinisso-raym-raymin kindir dilinink-rumi	il CDI
Overall Pressure Le	vel Data	(Vn)	quiv. to	db SPL
RMS pressure Level	(C)	('K)	gh Augustrajas, s. p. p. p. ministra in resp. szin – szin eszzenszi eres szermező eszermezőse szermésző	
	(IMG)(LG/(V _C)		
dor	No. of the last of		on .	
				psi

CALC	5		REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	Volum
CHECK	MUS	r - 2 3			OF MICROPHONE OUTPUT	D7-8008A
APR.					1477 1-116 1	PAGE
APR					THE BOEING COMPANY	F16 136



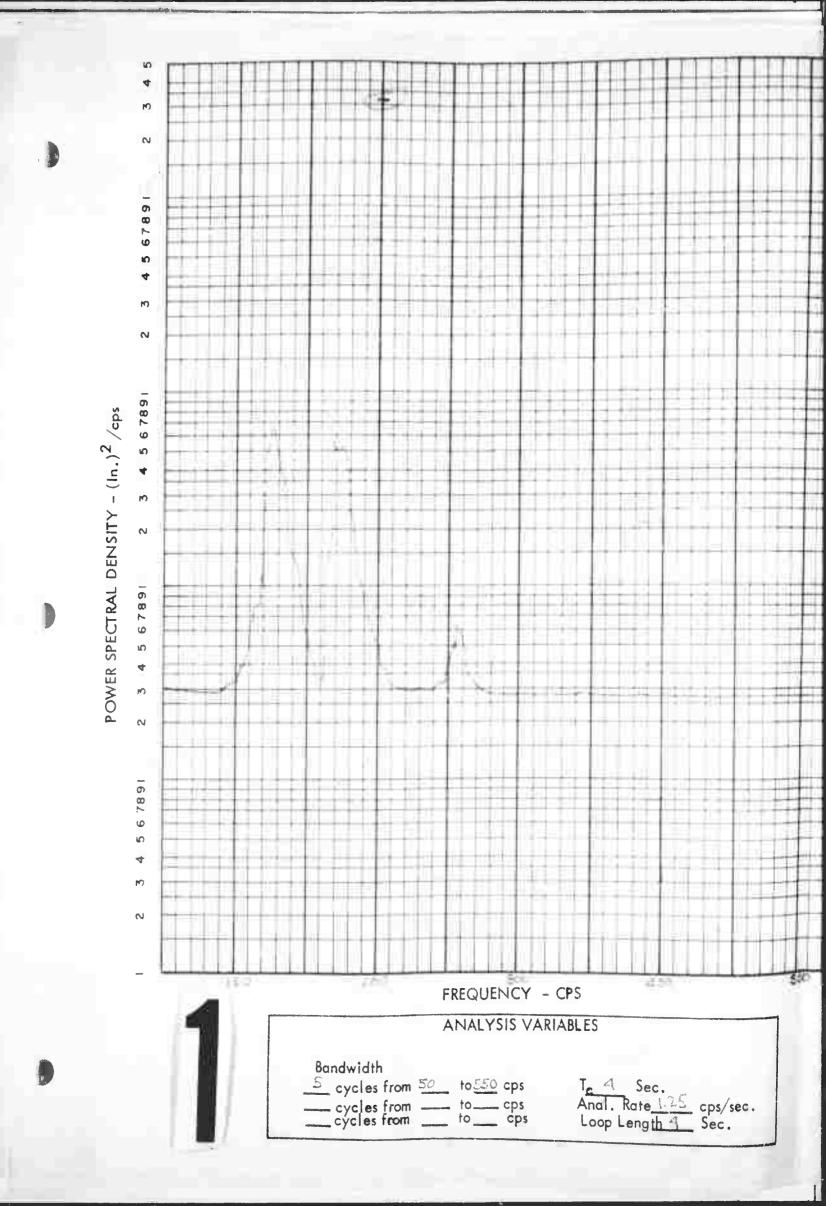
DATA IDENTIFICATION

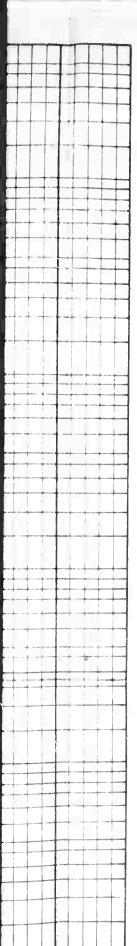
Test Title PANEL ATTACK	The second secon		PR	EUN
EWA No. 5593-1		Panel o	r Sp	ecimen No.
	Tape Chann	el	14-	Mic. No.
19	3			P 300
Elapsed Test Time		Mic. R VL =	MS	Level at Sonic Lab. Volts

CALIBRATION								
Tape No.	Tape Char	inel	Data Tape RMS Volt					
		= 5 V	ms on Tape © cp	S				
Line Amplifier Settings For Calibration $G_c =$; for Data $G_d =$ Lab. Gain $LG =$ Tape Monitor Gain $LG =$ Tape Monitor $G_c =$								
		itor Gain T	$MG = \frac{G_d}{G_c} = 1$					
Microphone Sensitivi								
S = , 170 psi/Vol		rms = 16	db SPL					
Equivalent of Calibra $P_{c} = V \cdot S$	tion - psi =5		.145					
Equivalent of Calibro $\frac{P_c}{(TMG)(LG)}^2$	[] {	the state of the	5.25×10-3 ps12/c	os -				
Analyzer Attenuator	Setting db	Log (Converter Setting db					
Calibration Plotted a	t		ps1 ² /cp					
Overall Pressure Level	(Pc)	(V _R)	juiv. to db S	PL.				
			psl					

SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)

CALC	1-1	7	REVISED	DATE	DENICITY ANIAL VEIS	VI T
CHECK	RUS	10.23			POWER SPECTRAL DENSITY ANALYSIS	VOC 1
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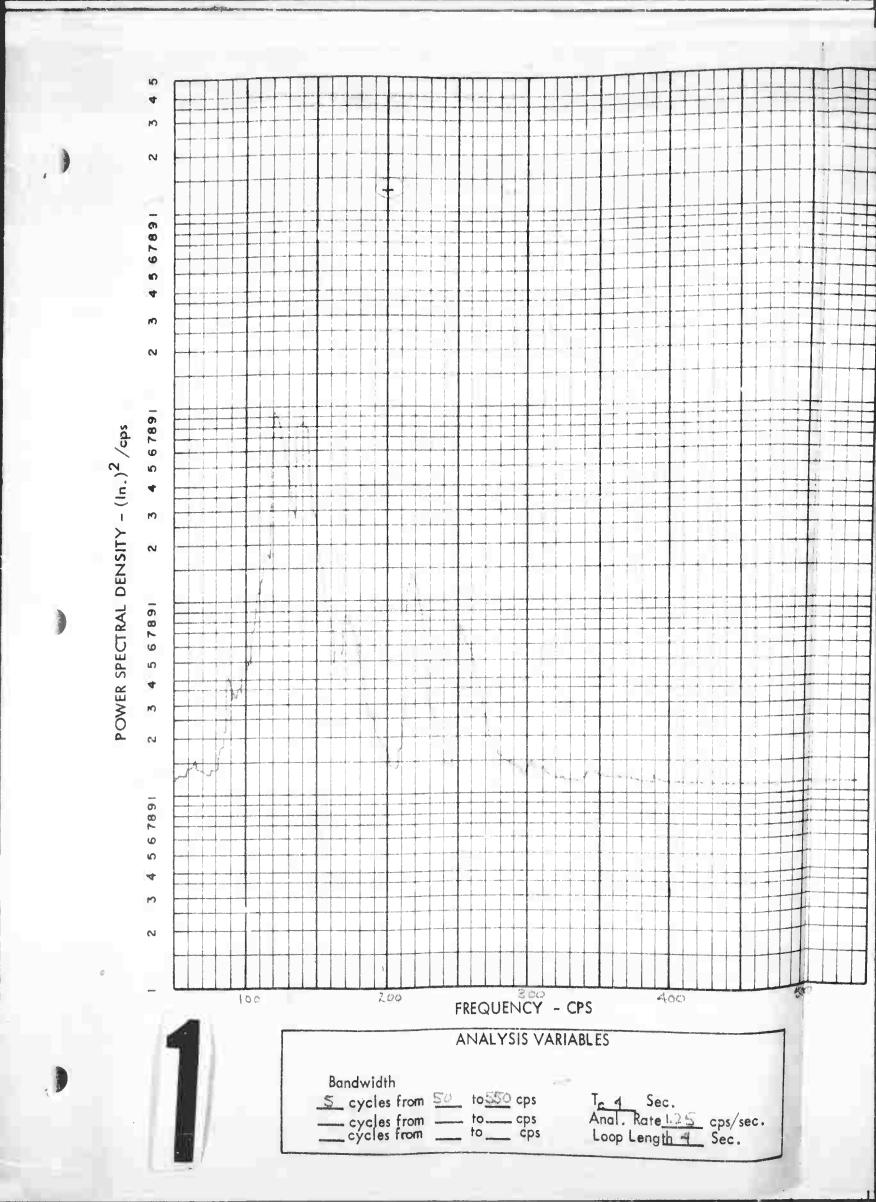
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DATA IDENTIFICATION

Test Title			
PANEL ATTACH	TYFE I	FREL	IM.
EWA No. 5593	depend	Panel or S	pecimen No. 417
Tape No. 19	Tape Chan	nel	Displacement Pickup
Elapsed Test Time		P/U RMS L VL =	evel at Sonic Lab. Volts

	ÇAL	IBRATION		
Tape No.	Tape Char	nel	V _R = .	
Calibration Voltage $V_{a} = -5 V_{rms}$	into Line A	mp.; V _c =	5 V _{rms} o	n Tape 700cps
Line Amplifier Setting For Calibration	G = . \	; for Dat	α G _d =	7.
Lab. Gain LG =	Tape Mon	itor Gain T	$MG = G_d = G_c$	~
Displacement Pickup \$ = 0.08 in./	Volt			
Equivalent of Calibro $D_c = V_a \cdot S =$	ration - in.	1000 =	0359	
Equivalent of Calibre $\left(\frac{D_c}{(TMG)(LG)}\right)^2$	C m	5-1		in. ² /cps
Analyzer Attenuator	Setting db	Log Con	verter Setting db	
Calibration Plotted			ngag ugahya gerakki 1977 min simulahki kabupya dipulapunga gagu sikk	In. ² /cps
Overall Deflection RMS Defl. Level		(R) =		
stader over the state of the st		enterente entere		psi

CALC	J		REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	VOLT
CHECK	YUS	10-23			OF DISPLACEMENT PICKUP	
APR.					1477 1101	DZ-30084
APR					THE BOEING COMPANY SEATTLE 24, WASHINGTON	FIG 138



DATA IDENTIFICATION

Test Title

PANEL ATTACH TYPE T FRELIM.

EWA No. Panel or Specimen No.

Tape No. Displacement Pickup

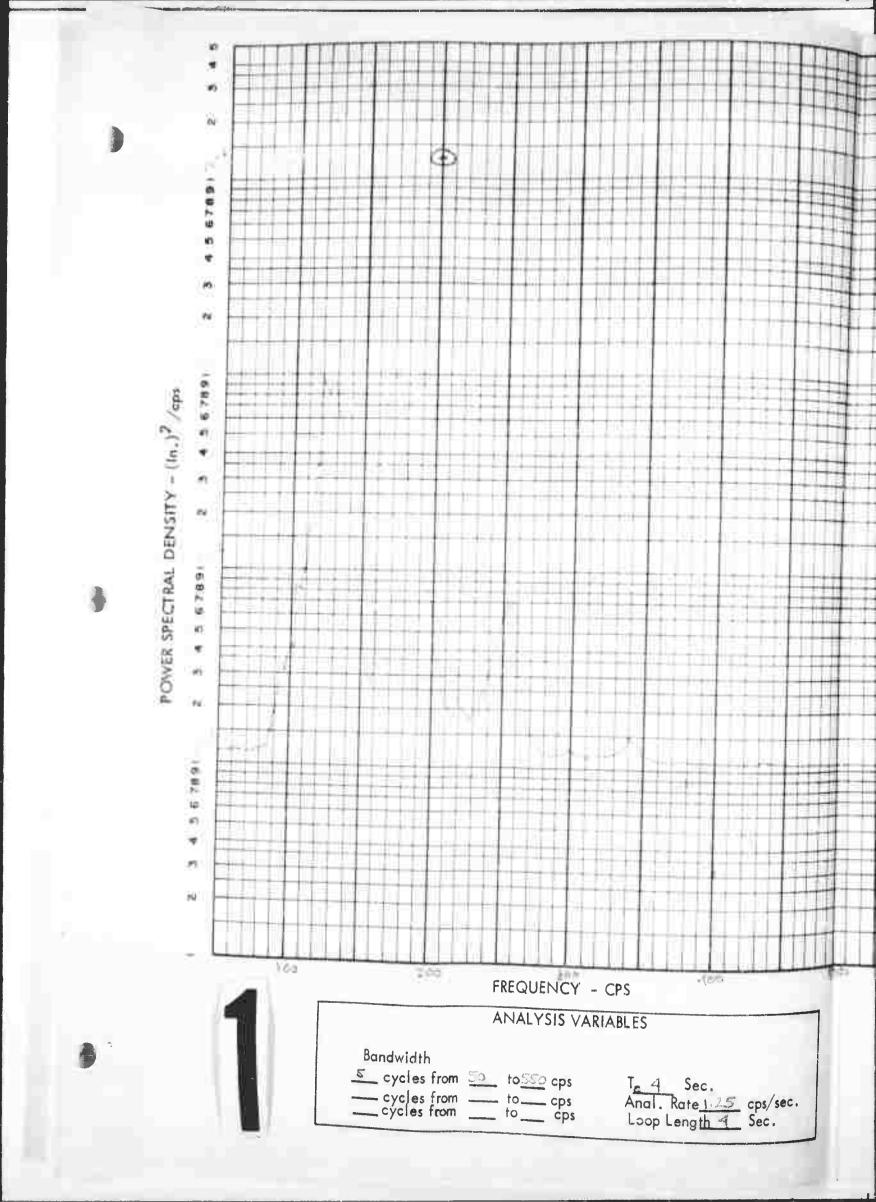
Elapsed Test Time

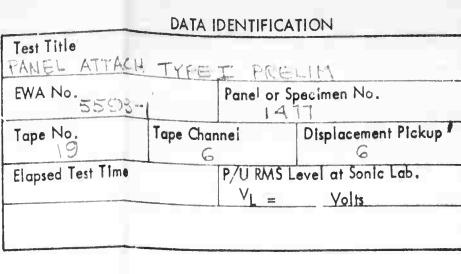
P/U RMS Level at Sonic Lab.

V = Yolts

CALIBRATION Tape No. Data Tape RMS Volt Tape Channel VR = Calibration Voltage Va = 5 Vms Into Line Amp.; Vc = Vms on Tape 200 cps Line Amplifier Settings
For Calibration $G_c = ...$; for Data $G_d = ...$ Tape Monitor Gain TMG = Gd = Lab. Gain LG = Displacement Pickup Sensitivity \$ = 0108 in./Volt Equivalent of Calibration - in. $D_{c} = V_{a} \cdot S = (.5, .0^{\circ})^{a}$ Equivalent of Calibration for PSD Plots in. 2/cps (TMG)(LG) Log Converter Setting Analyzer Attenuator Setting Calibration Plotted at $\ln \frac{2}{cps}$ Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(V_c) psi

CALC	1 = 7	<i>a</i> .	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	VOLT
CHECK	RDS	10 63			OF DISPLACEMENT PICKUP	ADCT
APR.					1477 Plu.5.	L2.80084
APR.					THE BOEING COMPANY SEATTLE 24, WASHINGTON	PAGE FIG139





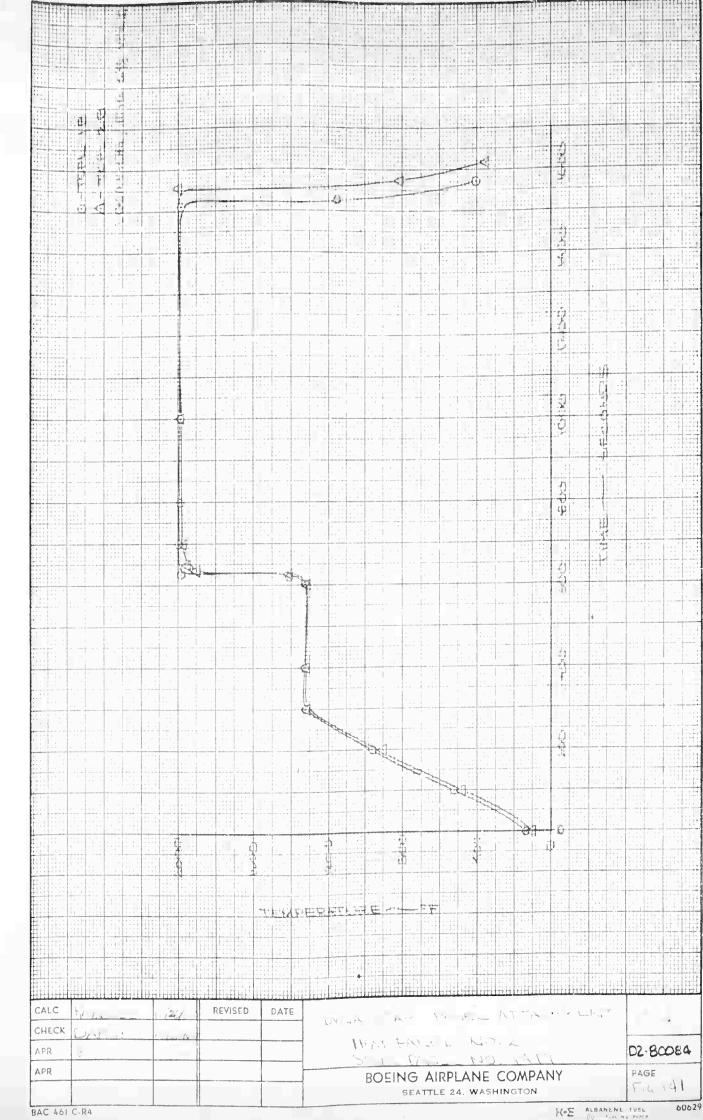
CALIBRATION Data Tape RMS Volt Tape Channel Tape No. V_R = , , = ; Calibration Voltage Va = 5 Vms Into Line Amp.; Vc = 5 Vms on Tape 200 cps Line Amplifler Settings For Calibration $G_c = 1$; for Data $G_d = 1$ Lab. Gain Tape Monitor Gain TMG = G_d = LG = Displacement Pickup Sensitivity S = , CIEr, In. Nolt Equivalent of Calibration - In. Dc = Va · \$ = (,5) ,010+ .0354 Equivalent of Calibration for PSD Plots

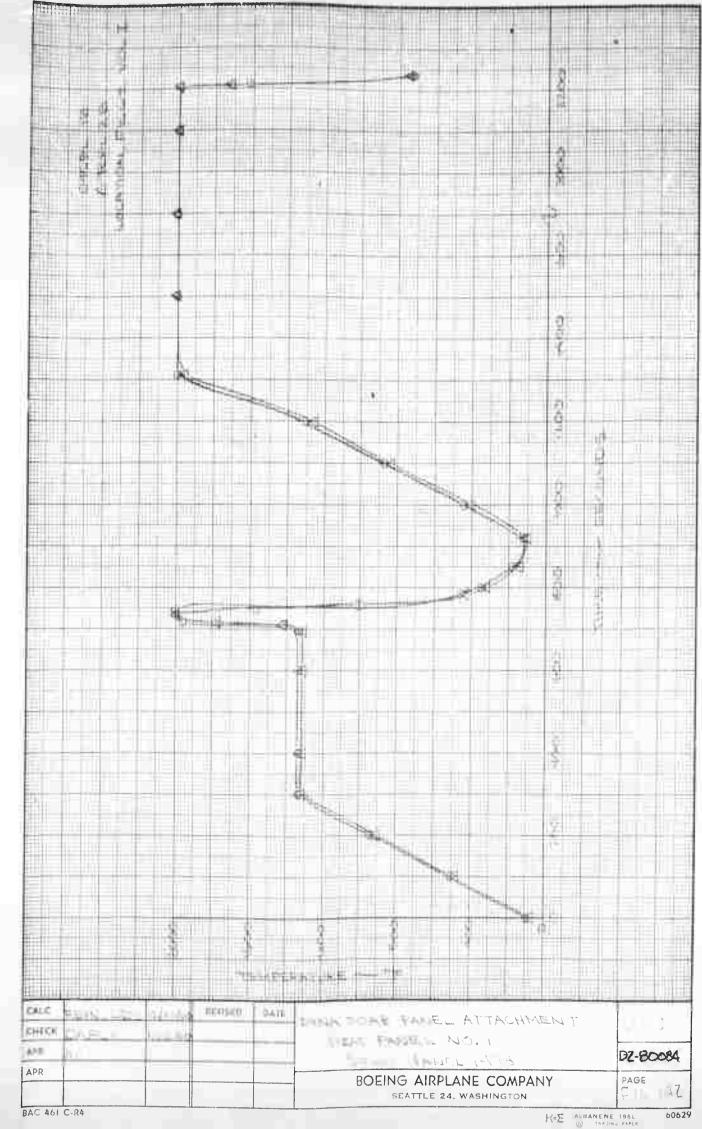
Dc 2 1.0254 1.5×1025 in. 2/cps \(TMG)(LG) Analyzer Attenuator Setting Log Converter Setting Calibration Plotted at In.²/cps Overall Deflection Level of Data RMS Defl. Level = $(D_c)(V_R)$ (TMG)(LG)(Vc) psl

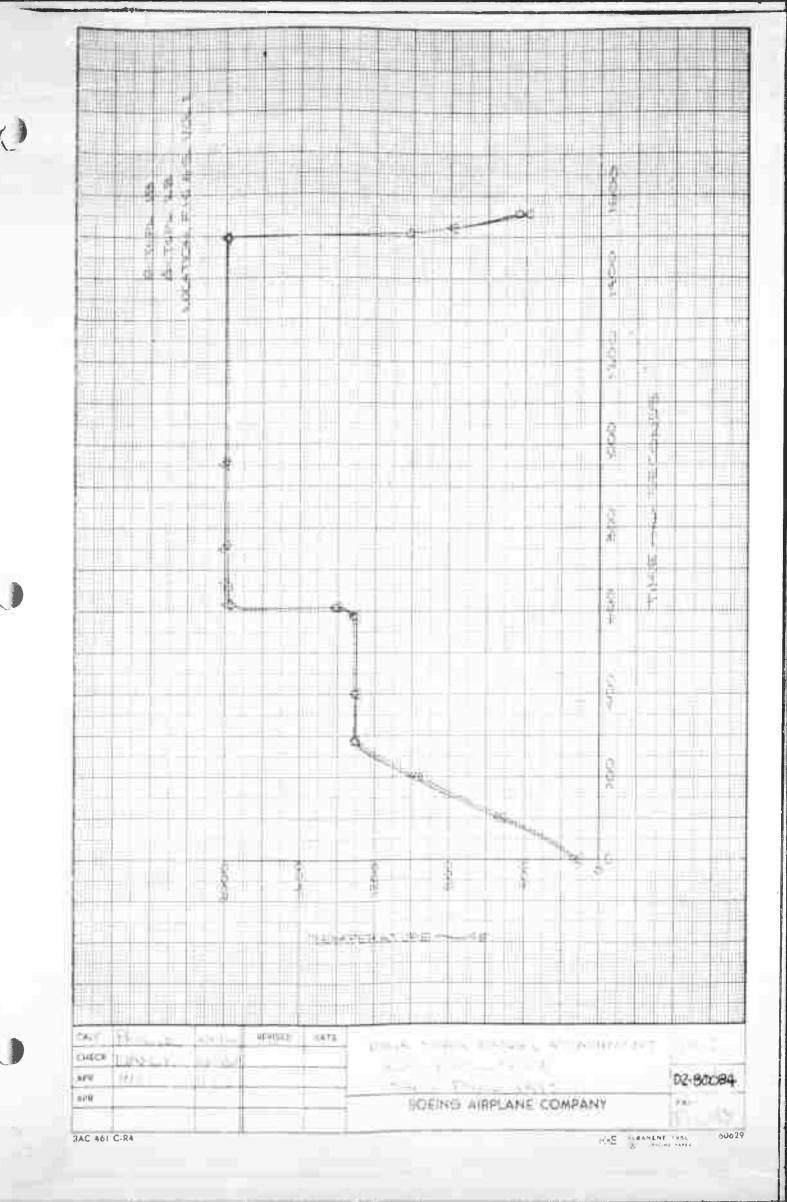
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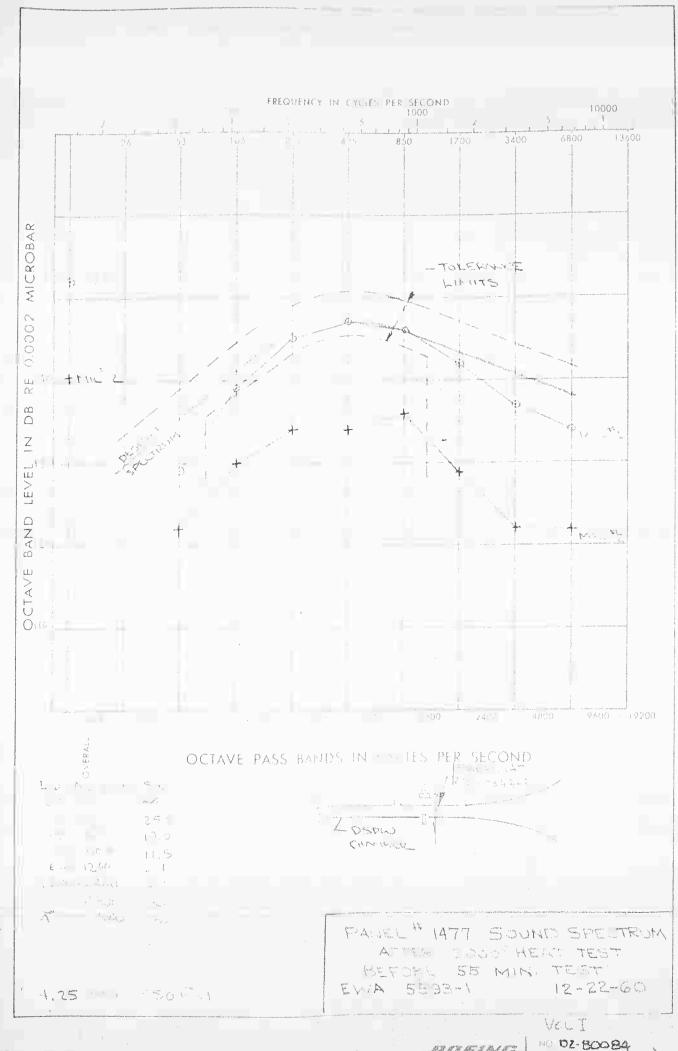
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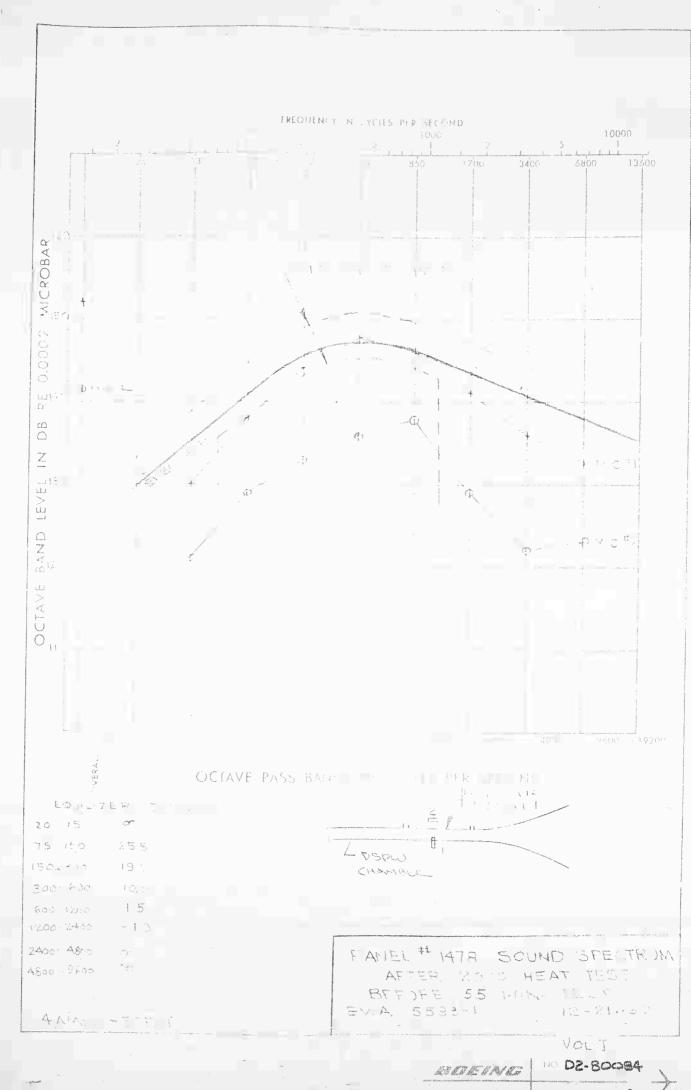






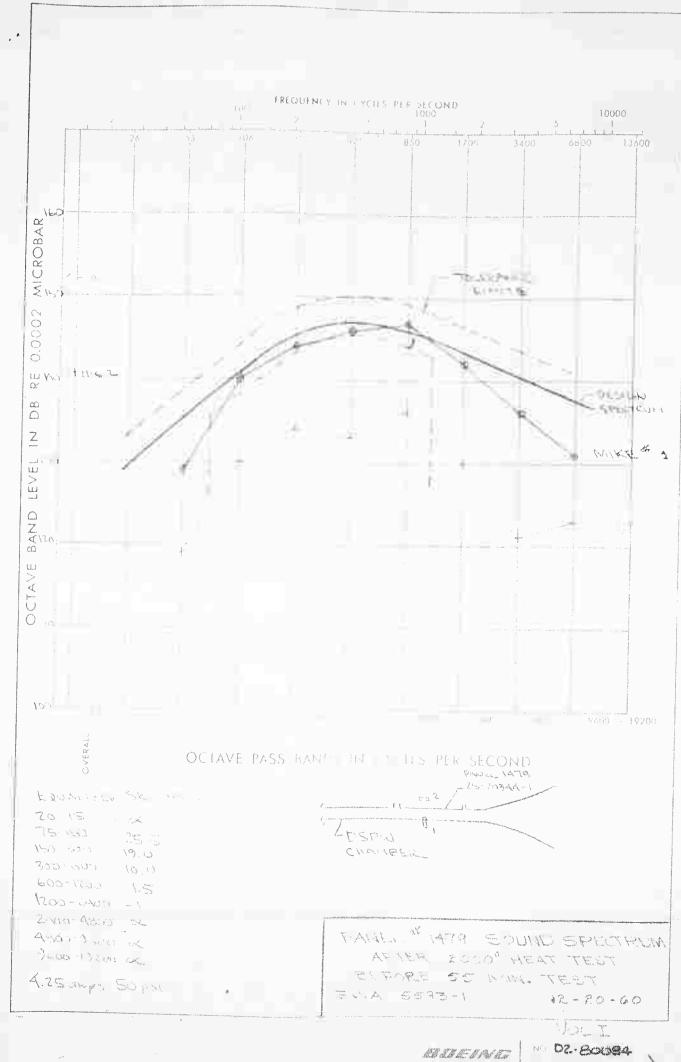


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U3 4134 1000 (WAS BAC 2413A-R2)

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U3 4134 1000 (WAS BAC 2413A+R2)

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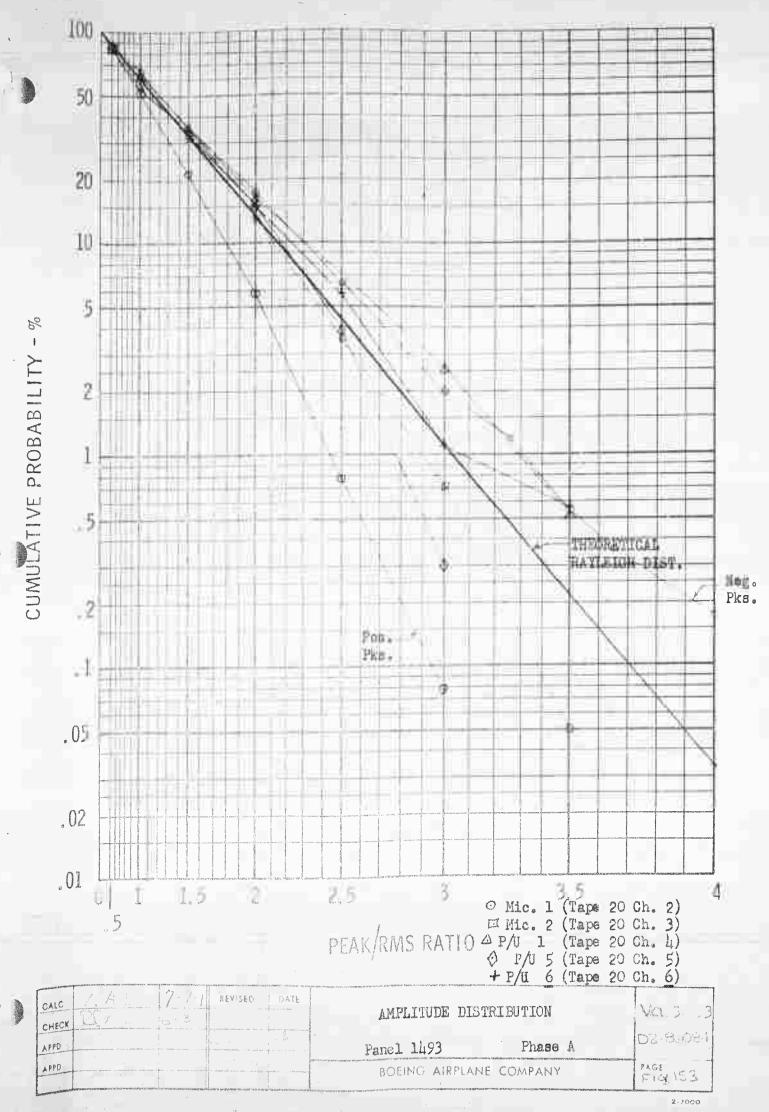
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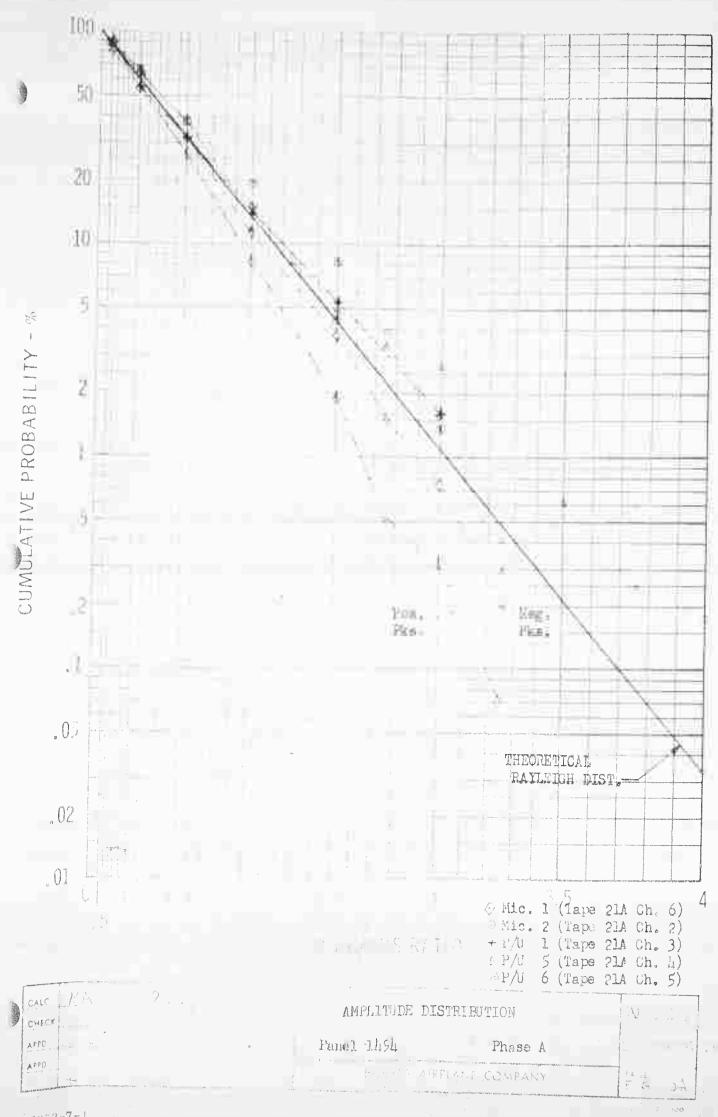
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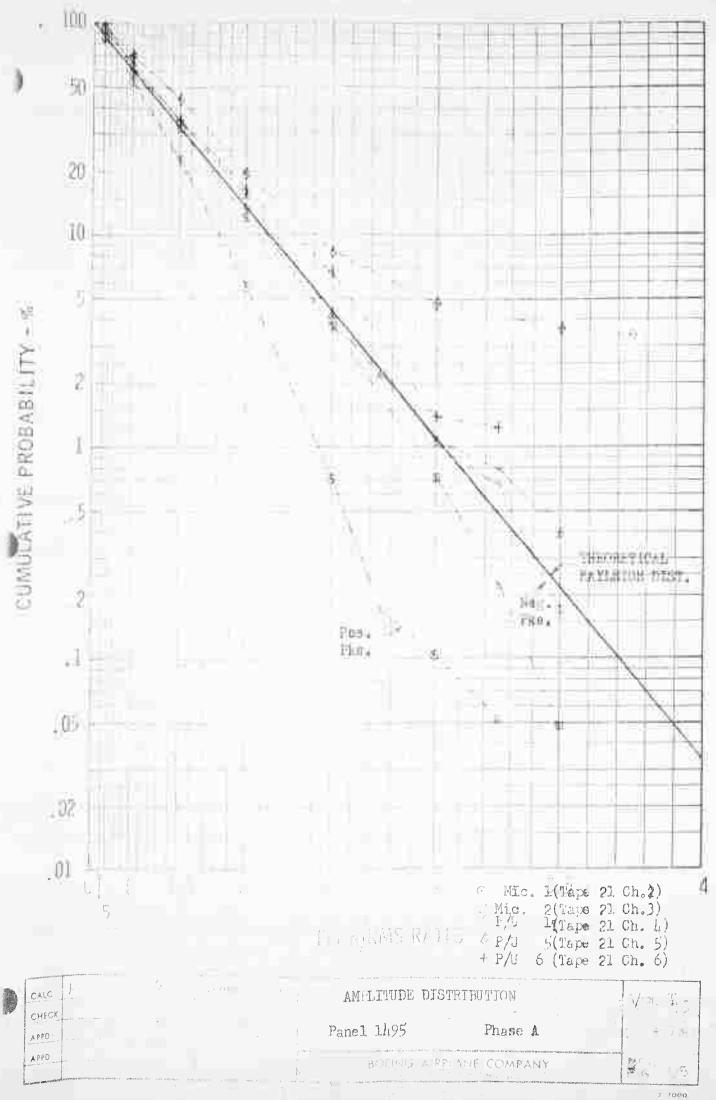
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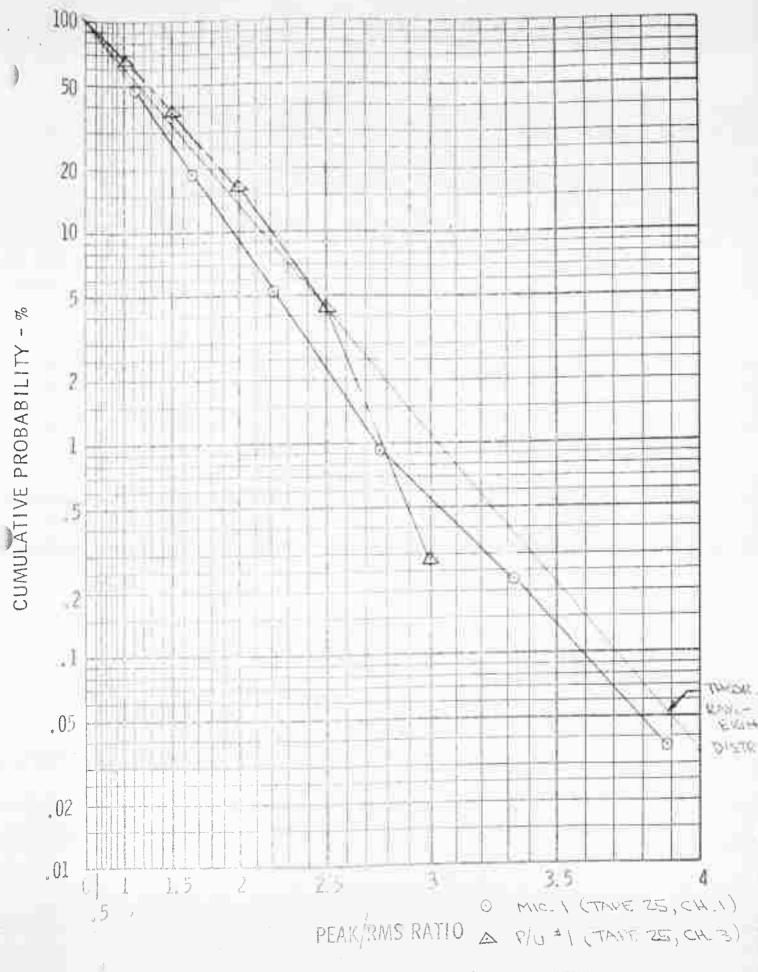
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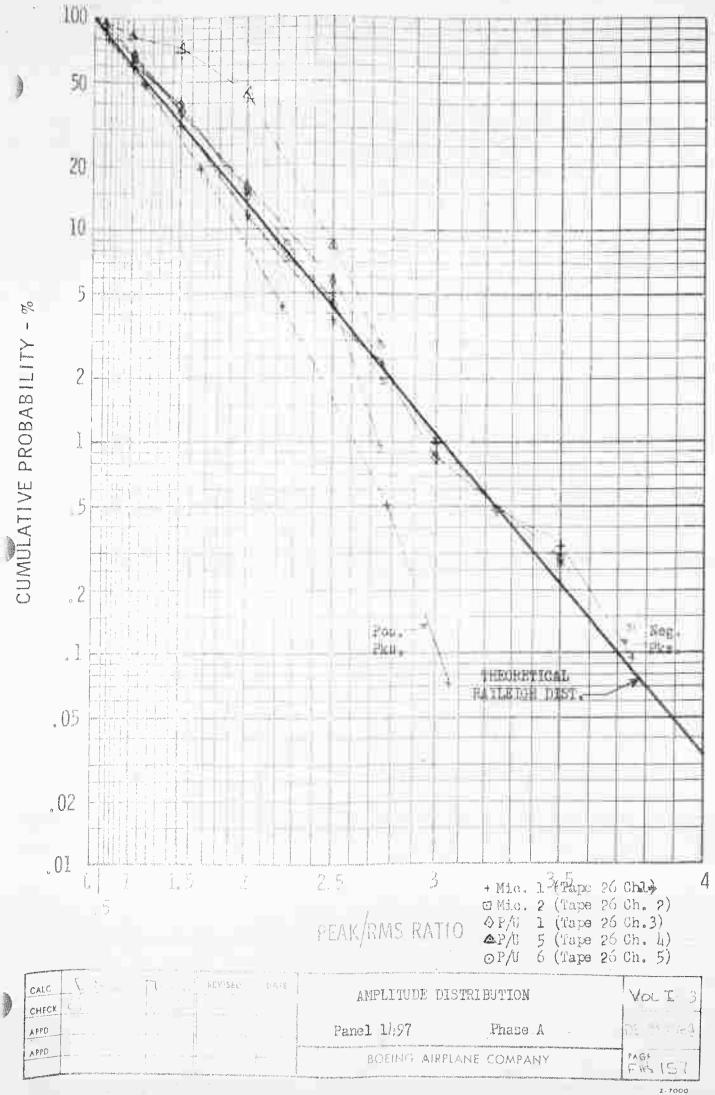
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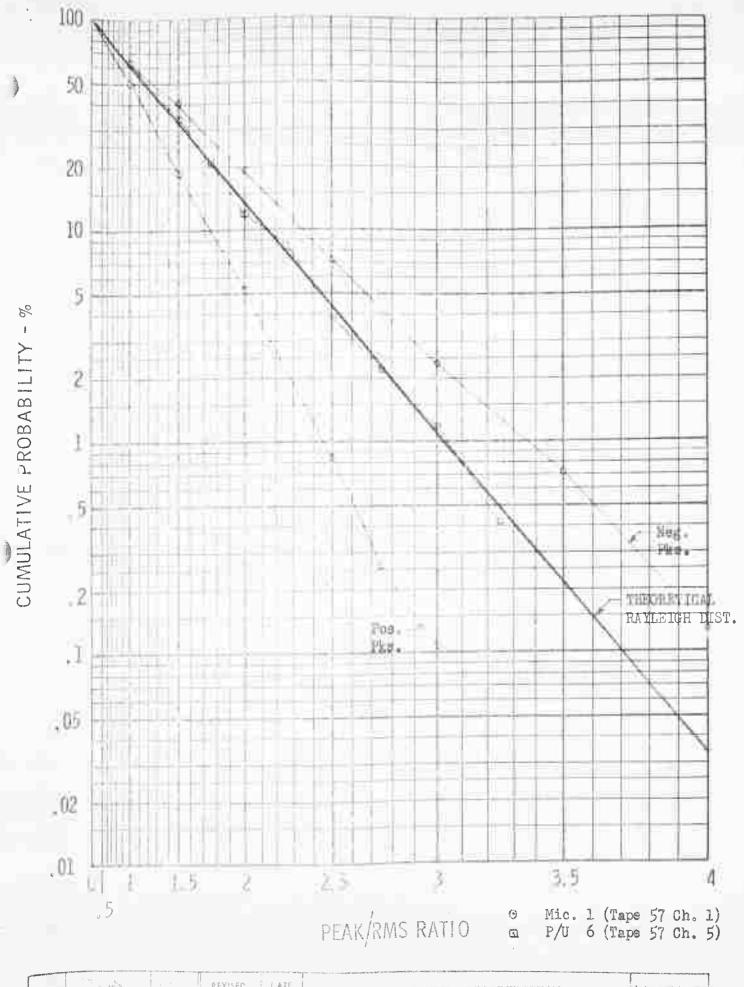




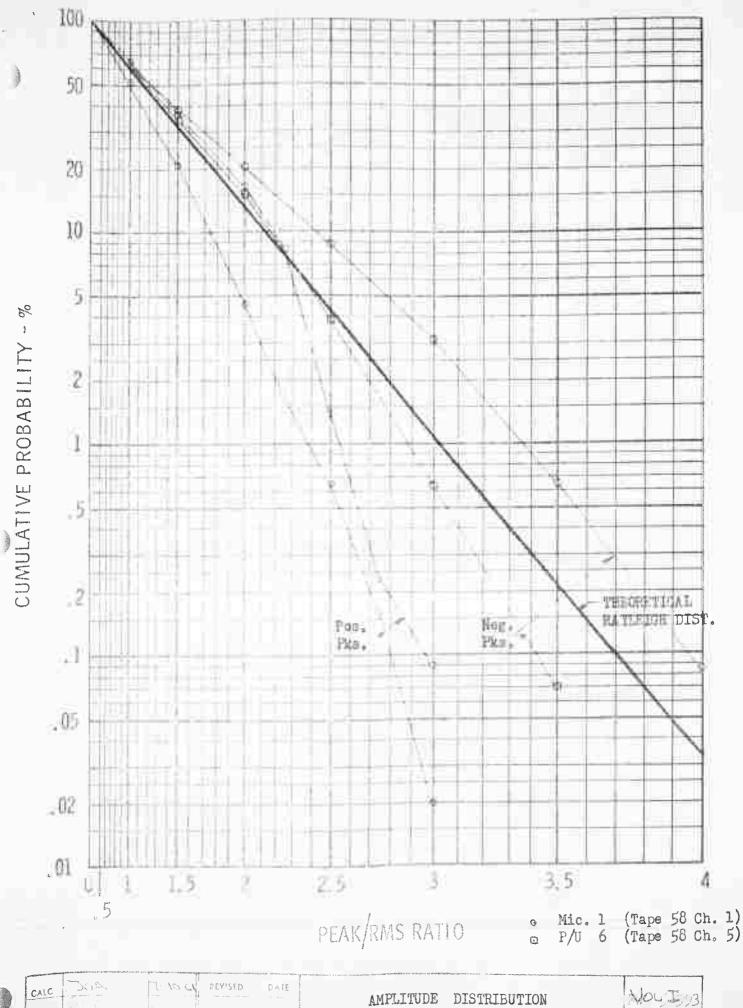
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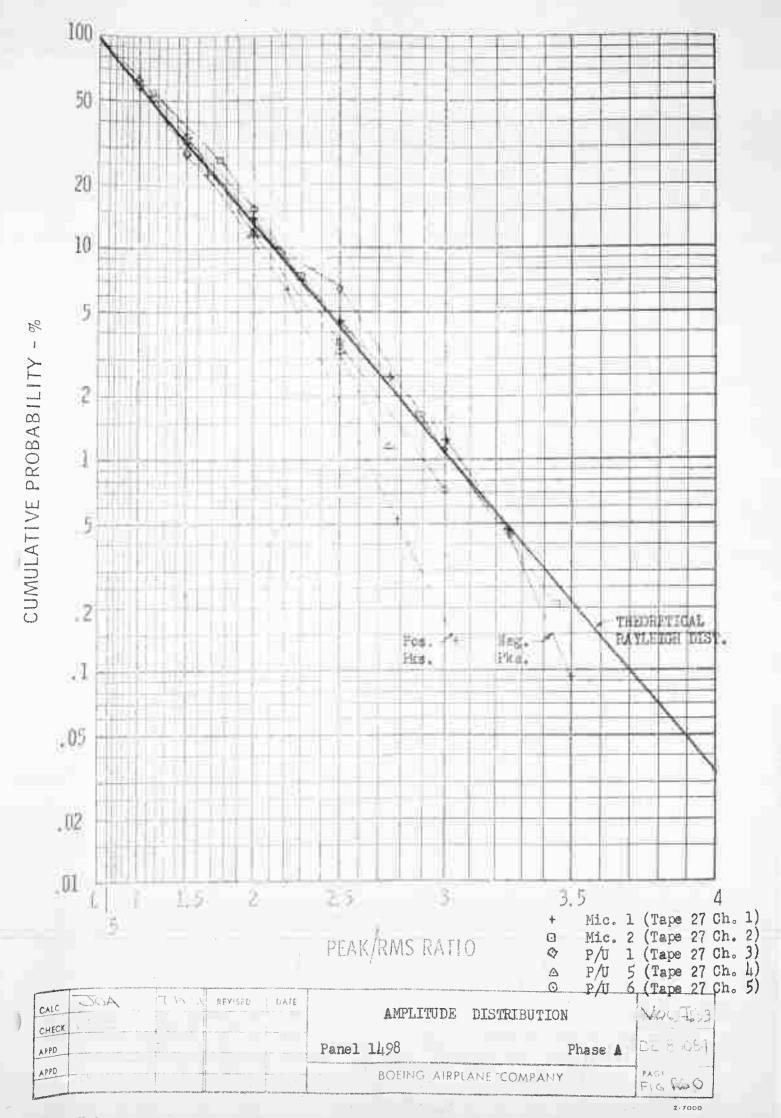
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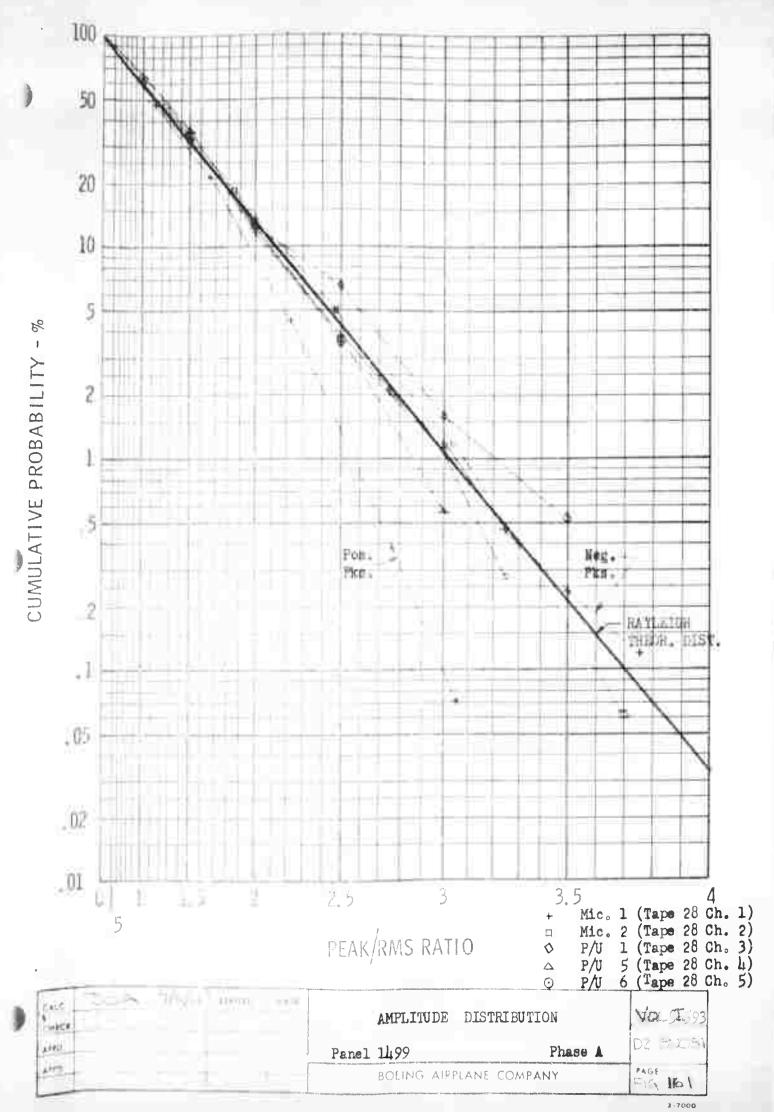




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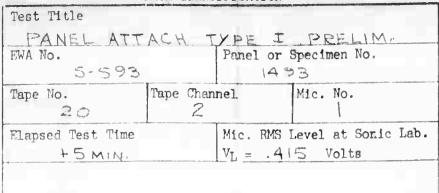


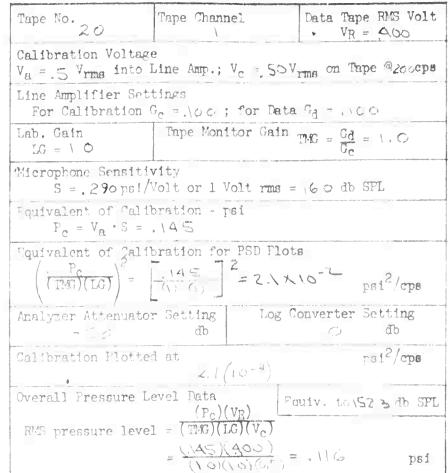


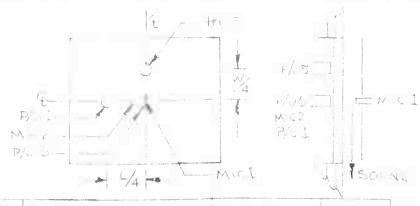


POWER SPECTRAL DENSITY - (ps1)2/cps 400 100 200 300 500 FREQUENCY - CPS ANALYSIS VARIABLES CALC 137 CHECK Bandwidth APR T_c 4 Sec.
Anal. Rate \.25 cps/Sec.
Loop Length 4 Sec. 5 cycles from 80 to 50 cps
cycles from to cps
cycles from to cps APR



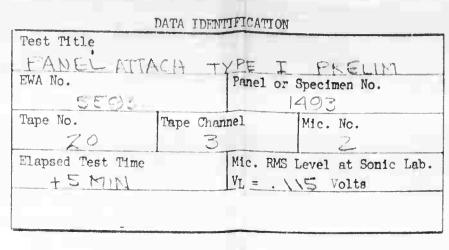




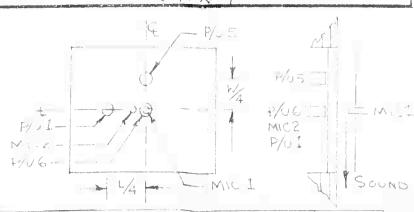


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		SEATTLE 24, WASHINGTON	FIGIGL
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4 5 6 7 8 9 9 4 POWER SPECTRAL DENSITY - (ps1)2/cps 102 1881 و 4 10,01 107 628 Lo FREQUENCY - CPS C.T. CALC ANALYSIS VARIABLES SOA CHECK Bandwidth APR. to 551 cps Tc A Sec.
Anal. Rate \-25 cps/Sec. cycles from cycles from to cps Loop Length A Sec. срв to



Tape No. Zo	Tape Channel	Data Tape RMS Volt VR = .Z\Z
Calibration Voltage	Line Amp.; V _c = 50 V	rms on Tape @ 200cps
Line Amplifier Settler For Calibration (Gc = 100 ; for Data	Gd = . 200
Lab. Gain IG = O	Tape Monitor Gain	$TMG = \frac{Gd}{Gc} = U$
Microphone Sensitiv	vity Volt or 1 Volt rms =	160 do SPL
Equivalent of Calib $P_c = V_a \cdot S =$		
	oration for PSD Plots 105 3.25	
Analyzer Attenuator	Setting Log Co	onverter Setting O db
Calibration Flotted	1 at 5 25 (10)) psi ² /cps
Overall Pressure Le	$(P_c)(V_R)$	uiv. to \40.5db SPL
RMS pressure level	$= \frac{(MG)(IG)(V_C)}{(2)(1)(.5)} =$	isq Joeco.



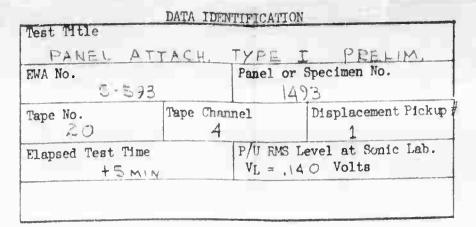
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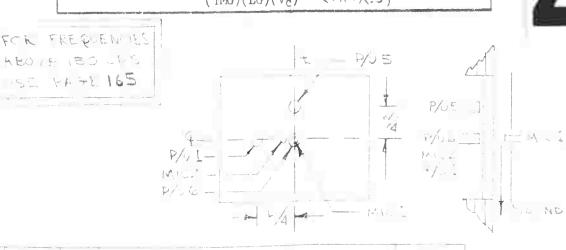
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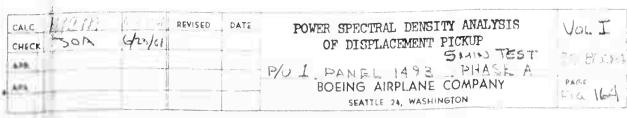
DECIBELS (Re 0.0002 Microbar)

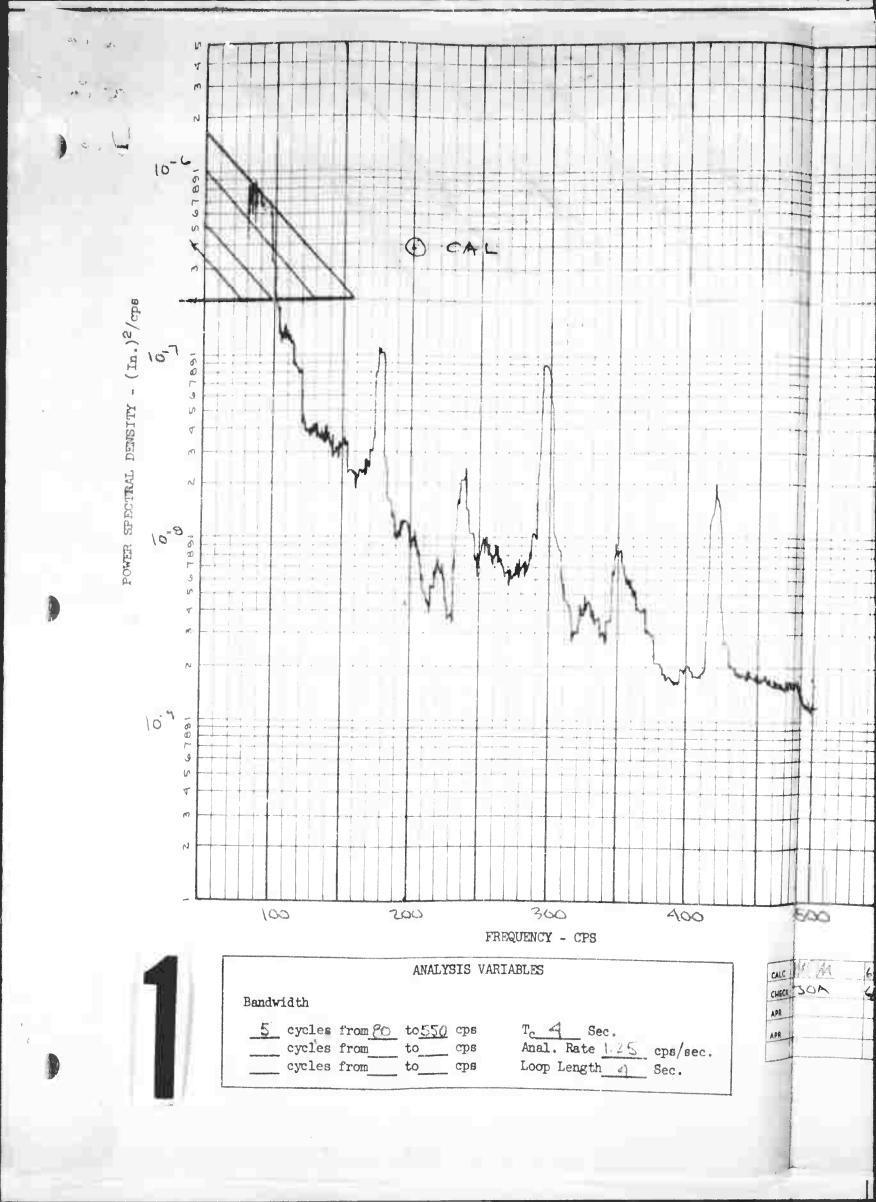
POWER SPECTRAL DENSITY - (In.)2/cps 10 100 200 300 FREQUENCY - CPS ANALYSIS VARIABLES Bandwidth T_c 4 Sec. Anal. Rate 1,25 cps/sec. 5 cycles from 80 to 550 cps
cycles from to cps
cycles from to cps Loop Length 4 Sec.

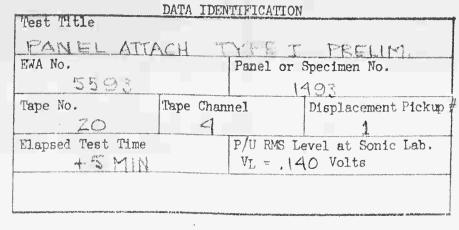


	ONDIBINITION	
Tape No.	Tape Channel	Data Tape RMS Volt
Calibration Voltage Va = ,5 Vrss into 1		OV _{rms} on Tape @ 200cps
Line Amplifier Set	Gc = .100; for D	ata G _d = . 100
Lab. Gain LG = 1. O	Tape Monitor Ga	$ \lim_{TMG} = \frac{G_d}{G_c} = 1.0 $
Displacement Pickup S = Ololin./Vol		
Equivalent of Cali		
Equivalent of California $\left(\frac{D_{C}}{(TMG)(LG)}\right)^{2} = \left[\frac{C}{(LG)}\right]^{2}$	o)((0)	lots (15 A 10 - 3 in .2/cpt
Analyzer Attenuato:	2.0	g Converter Setting
Calibration Flotted	1 at \.225 X I	o-5 in.?/cps
Overall Deflection	Level of Data	
RMS Defl. Level =	$\frac{(D_{\rm C})(V_{\rm R})}{({\rm TMG})({\rm LG})(V_{\rm C})} = 0$	0353 (142) = 0100 in.

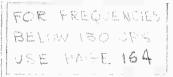


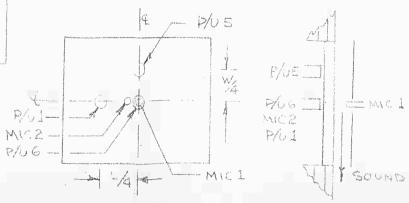




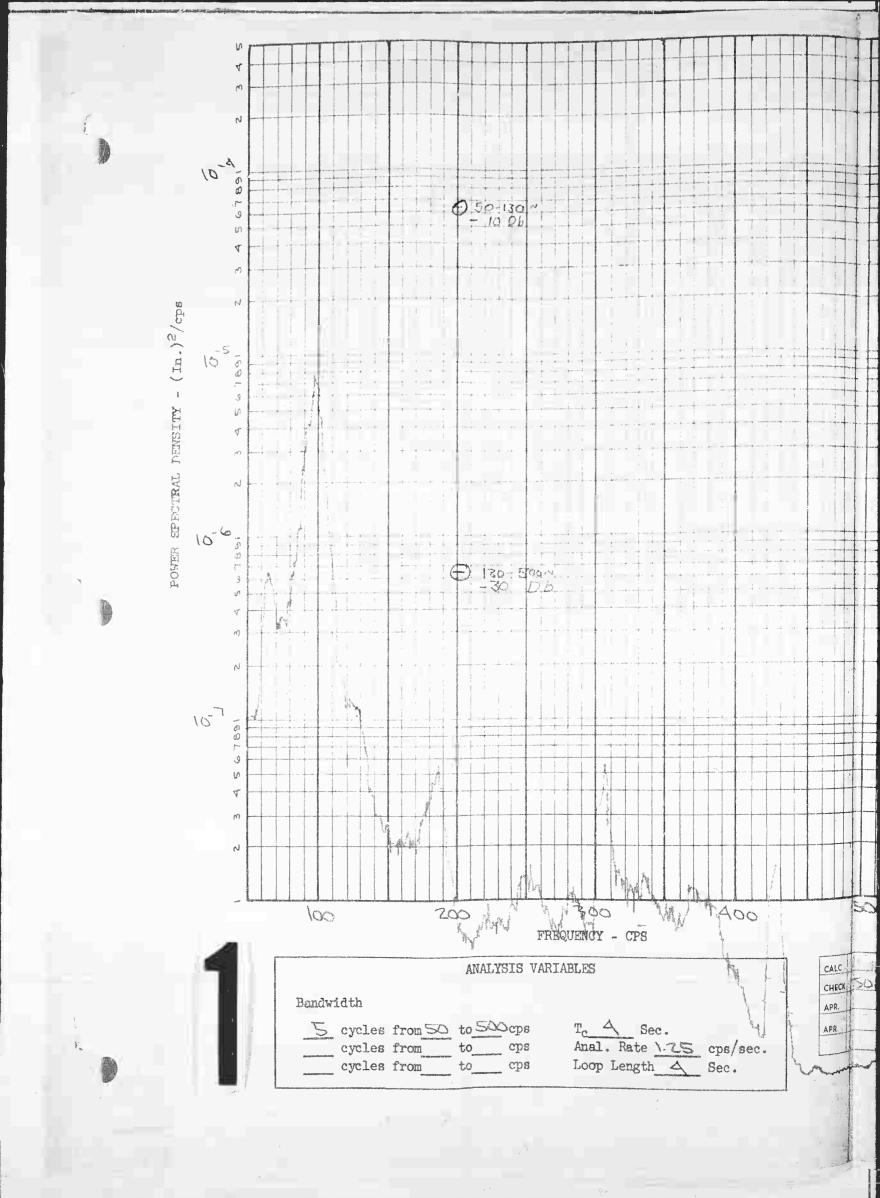


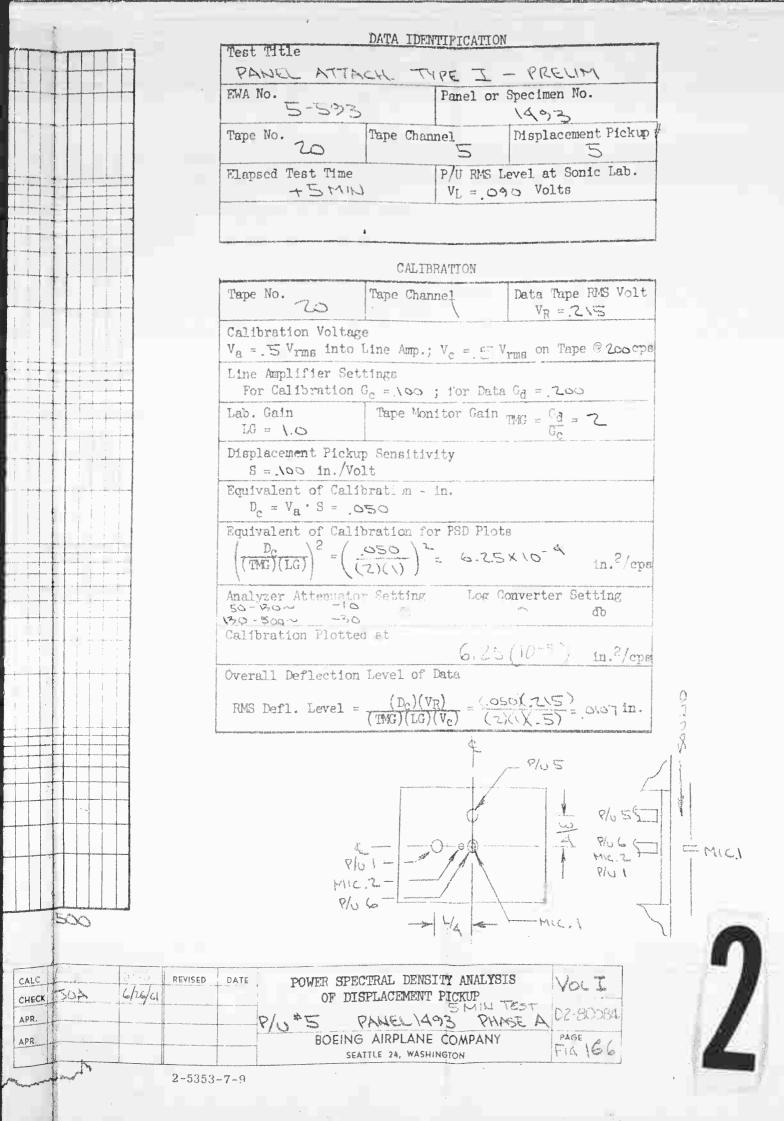
	interminant and in the second	
Tape No. ZO	Tape Channel	Data Tape RMS Volt
Calibration Voltage Va = .5 Vrms into I		Tms on Tape @700cp
Line Amplifier Sett For Calibration C	Ge = 100 ; for Date	Ga = . 100
Lab. Gain LG = (.0	Tape Monitor Gain	$TMG = \frac{G_{d}}{G_{C}} = 1.0$
Displacement Pickup S = . 3797 in . /Vol		очен терен постоя с с выбосова — на ч станований общенований общенований общенований общенований общенований о
Equivalent of Calib $D_c = V_a \cdot S = 0$		того — положения дологования дологования на подоставления в подоставления в подоставления в подоставления в под
Equivalent of Calib $\left(\frac{D_C}{(TMG)(LG)}\right)^2 = \begin{bmatrix} 0 \\ (1) \end{bmatrix}$	ration for PSD Plot 7535] 2 .oh o] = 1.225	
Analyzer Attenuator = 35	Setting Log C	onverter Setting O db
Calibration Plotted	at 3.87(10	in. ² /cps
Overall Deflection	Level of Data	egyterin tarakundigun occu yg (Mindrorelassi sumen kan kank fulu-mayndigiddiras kyloka gʻa ku ocque meng assag ma gʻo bayingi ligipidan i
RMS Defl. Level = .	$\frac{(D_c)(V_R)}{(TMG)(LG)(V_c)} = \frac{(33)}{(1)}$	535).[42] .0100 [7](65) in.
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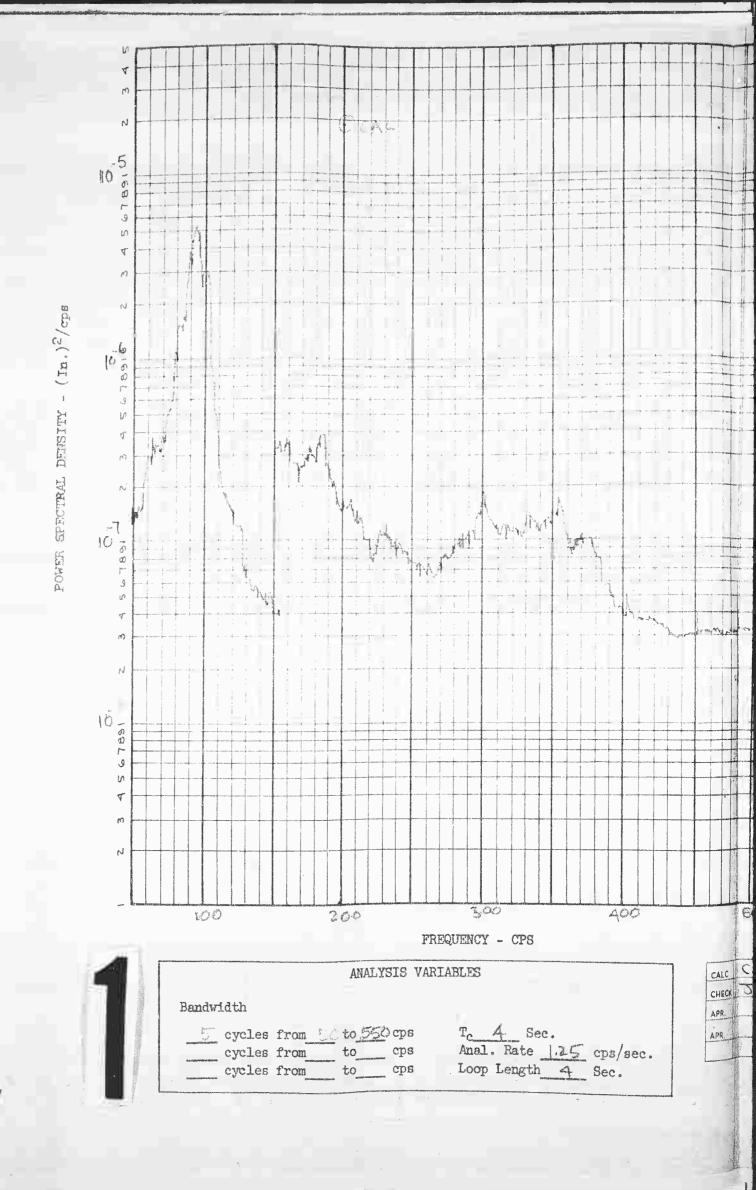


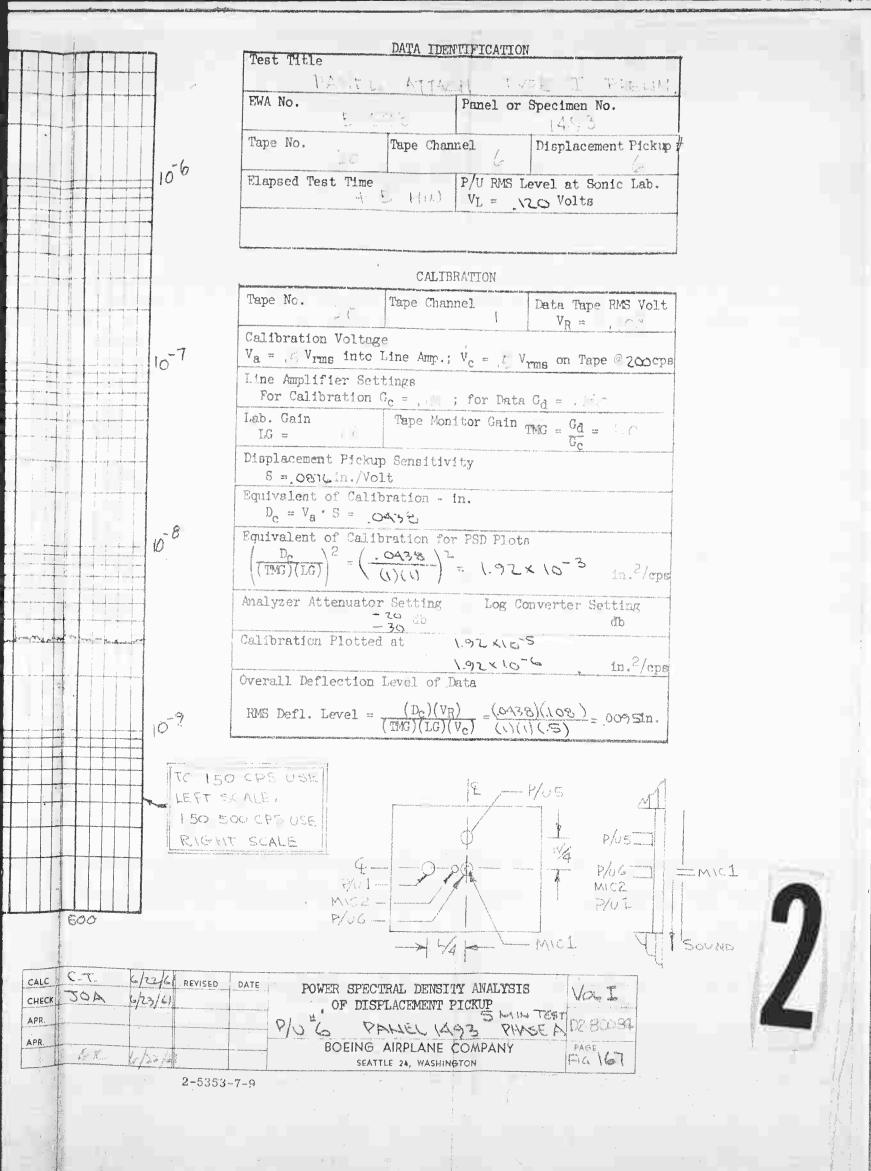


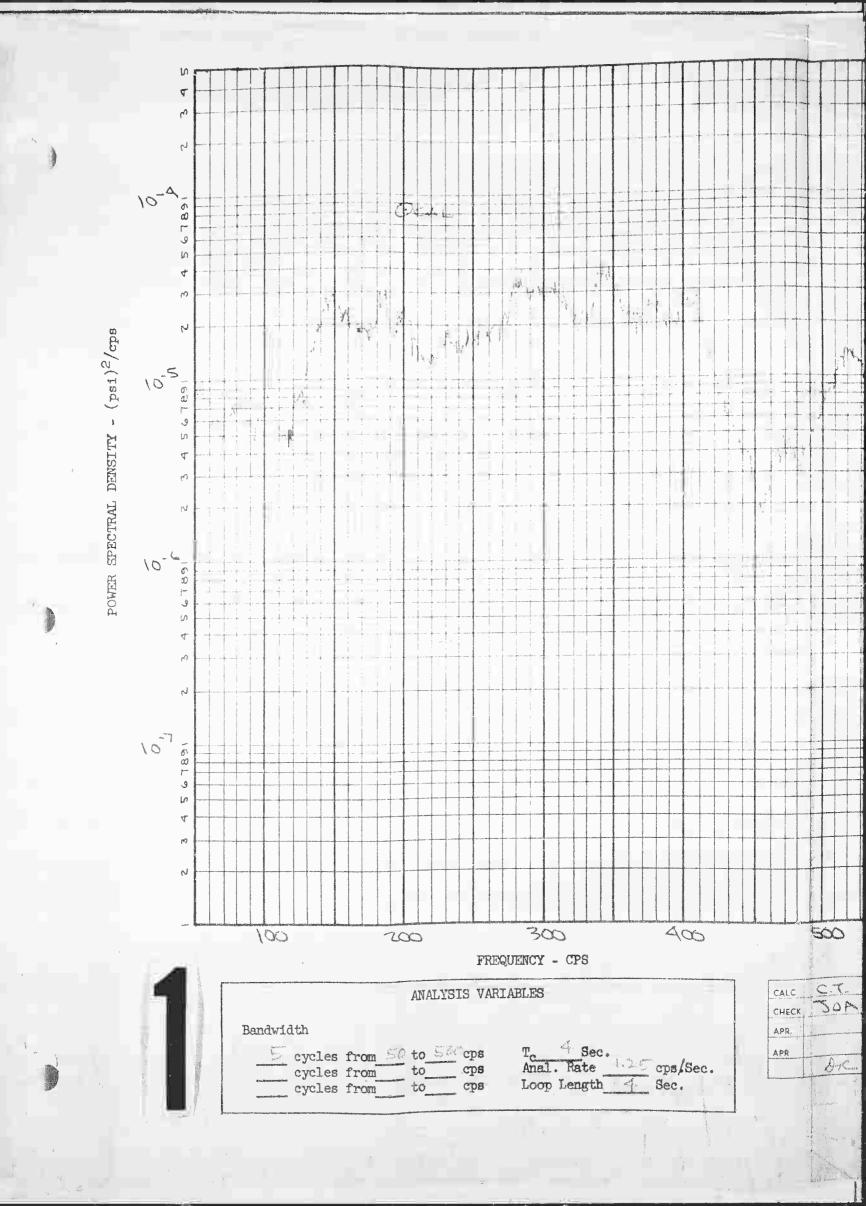
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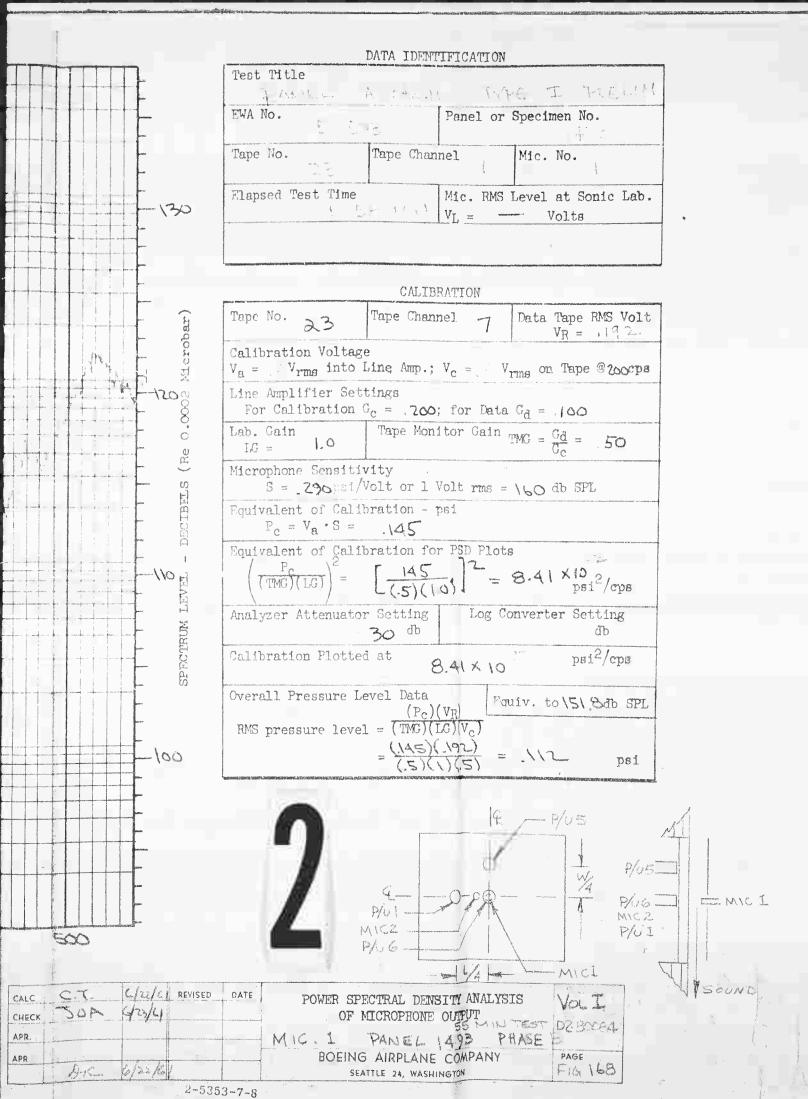










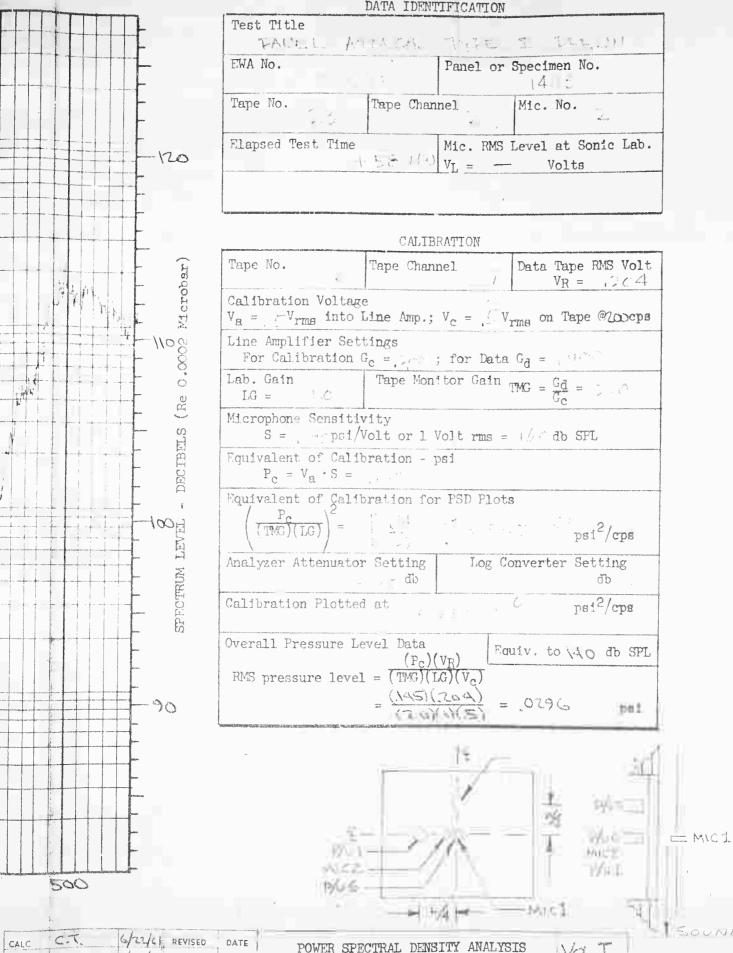


N 10 68 9 M 3 POWER SPECTRAL DENSITY - (psi)2/cps 100 و 4 10-7 67691 in 10-8-01 10 4. 300 100 200 400 500 FREQUENCY - CPS CALC CT. ANALYSIS VARIABLES CHECK SOA Bandwidth APR. cycles from 50 to 50 cps

cycles from to cps

cycles from to cps

Loop Length 4 Sec.



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POWER SPECTRAL DENSITY ANALYSIS

OF MICROPHONE OUTPUT

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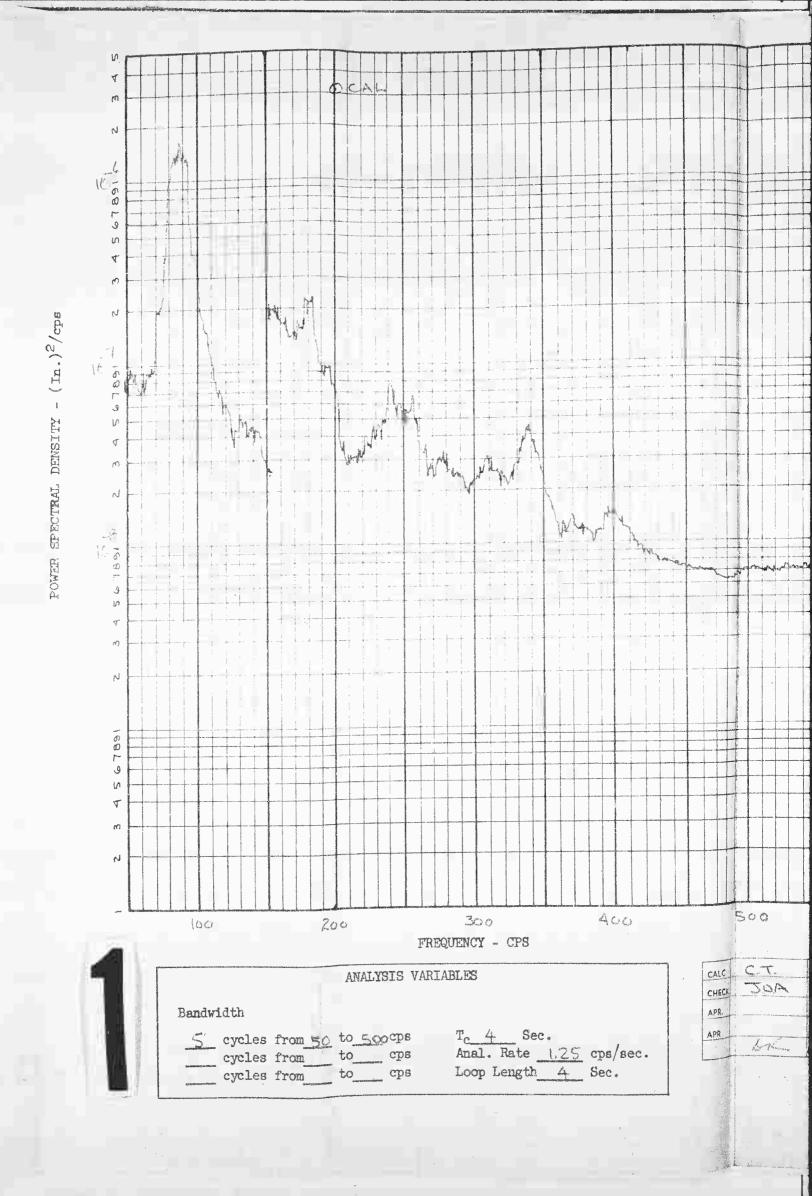
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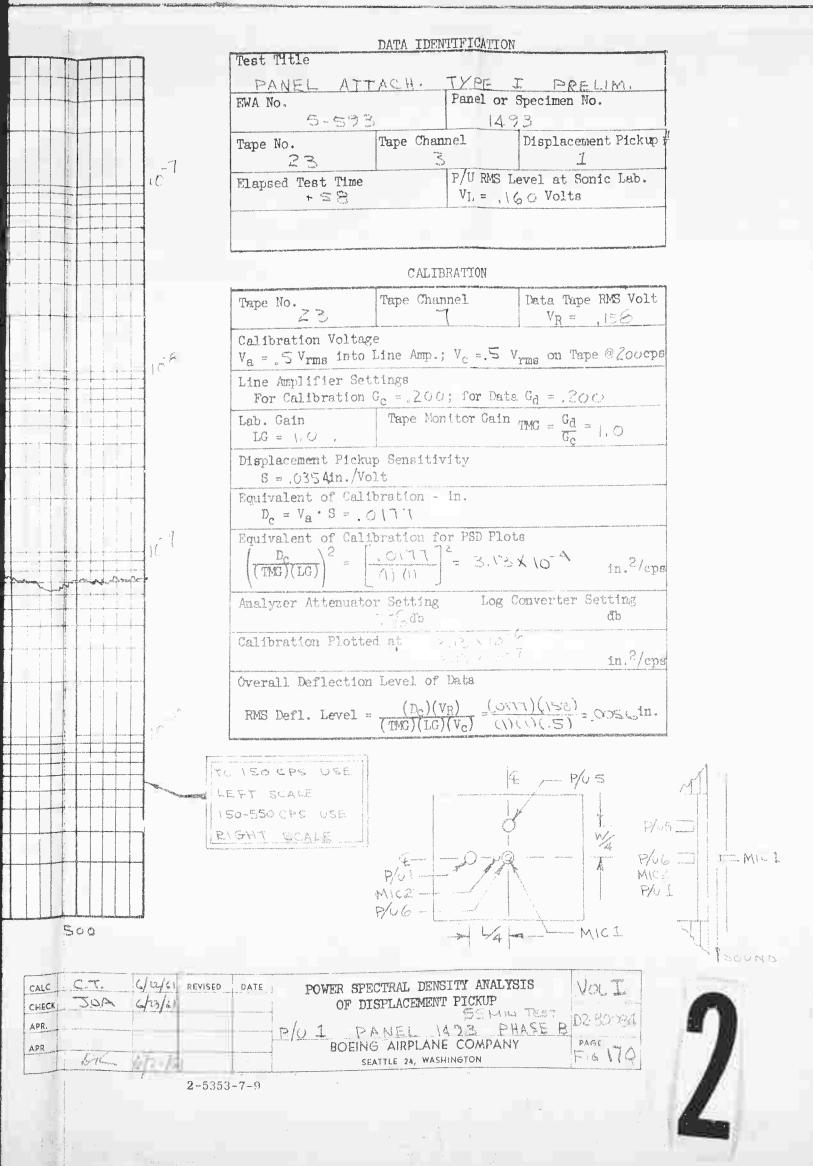
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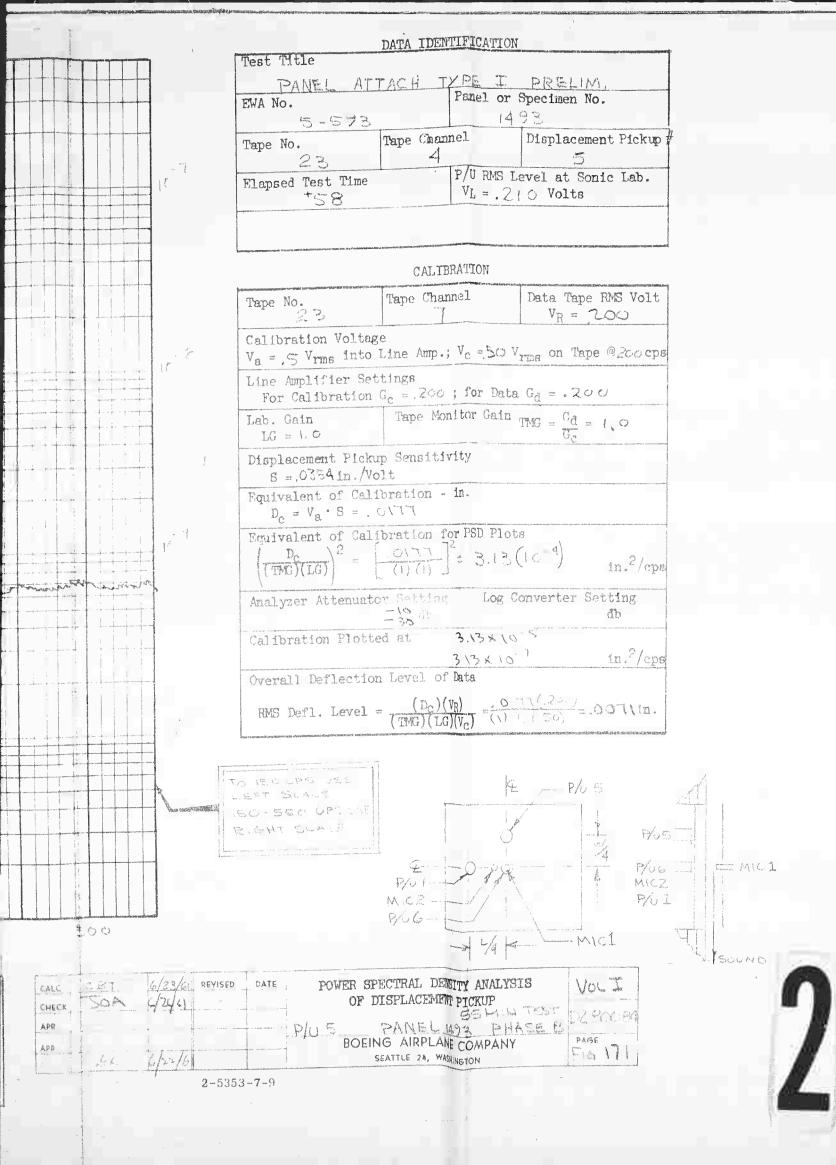
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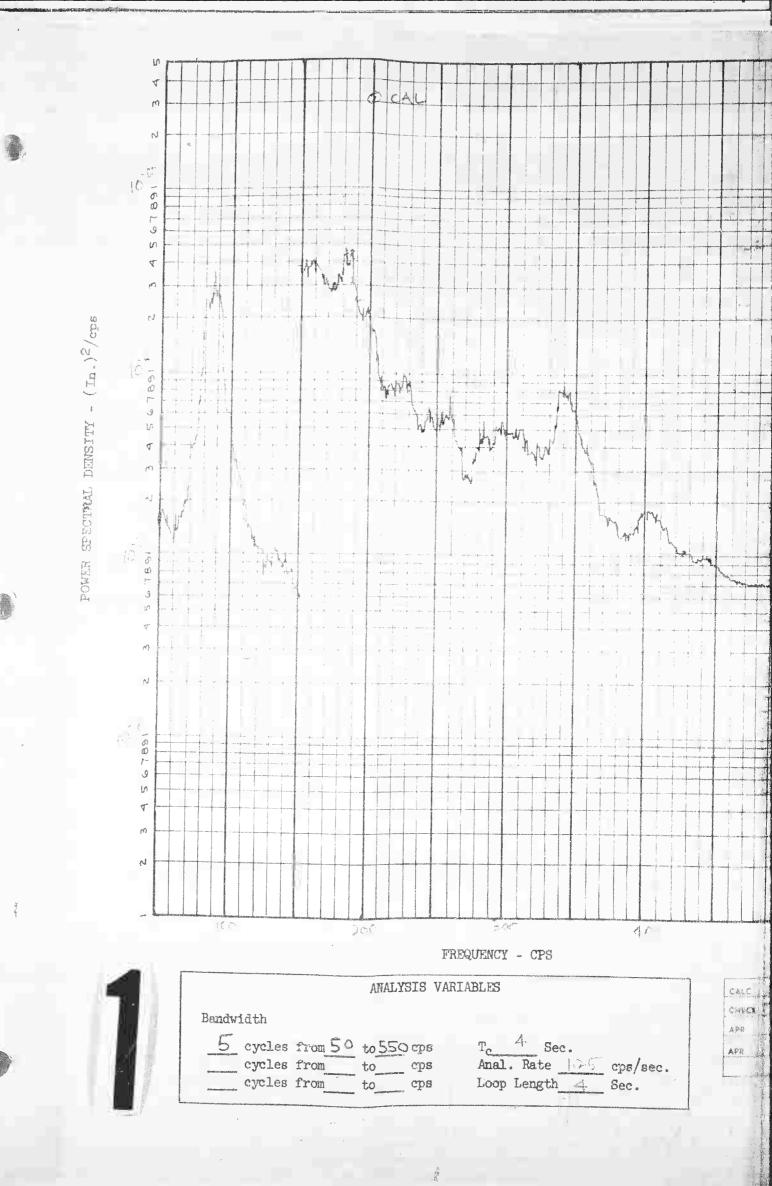
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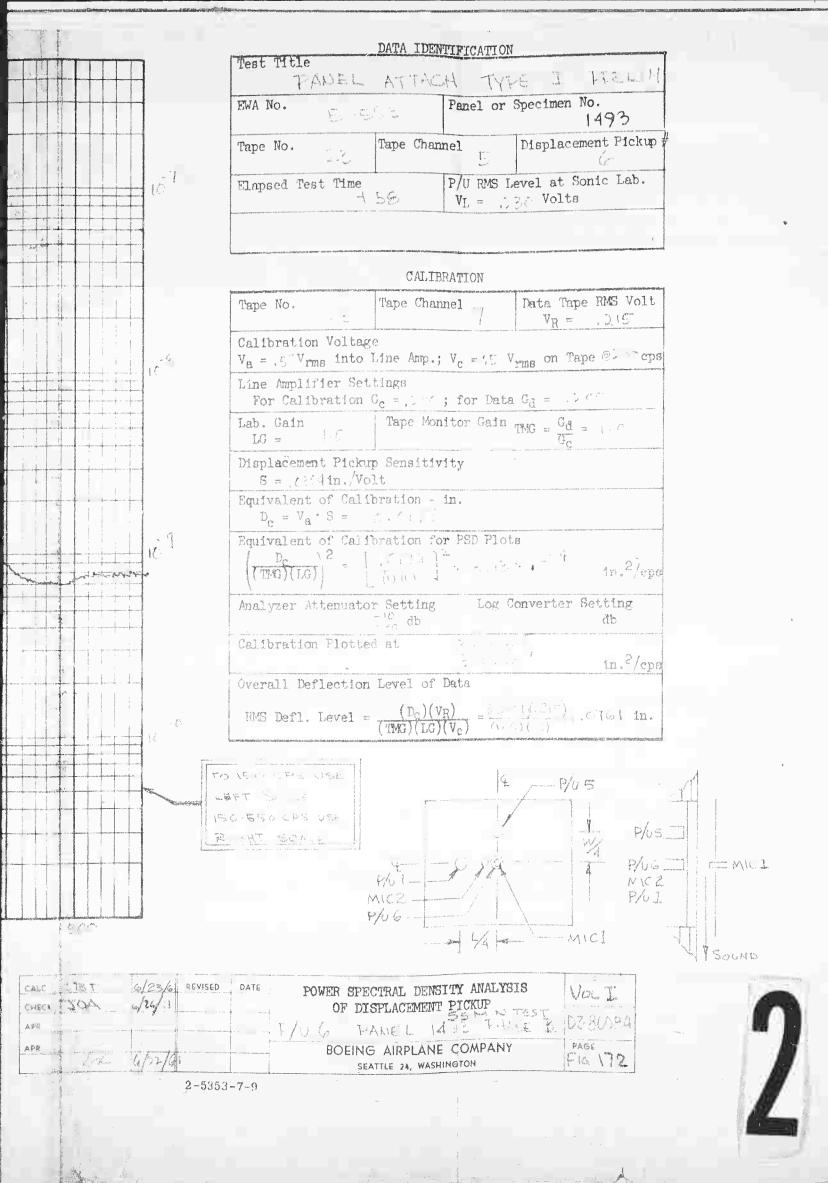


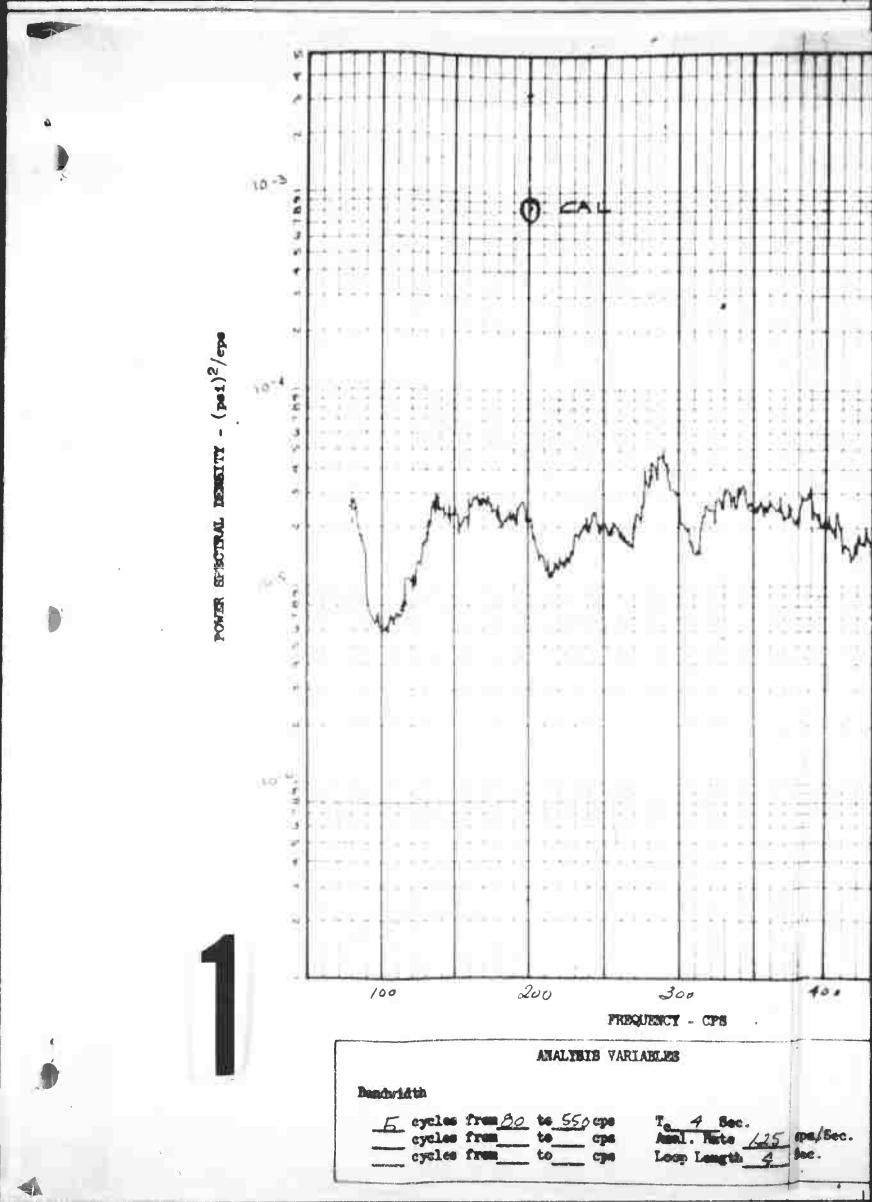
(1) 10-16879 M 4 POWER SPECIFIC DENSITY - (In.)2/cps 678917 67891 18819 M T 100 200 300 400 FREQUENCY - CPS ANALYSIS VARIABLES CALC CHECK Bandwidth APR Tc 4 Sec. cycles from 50 to 550 cps cycles from to cps Anal. Rate 1.25 cps/sec. Loop Length 4 Sec. cycles from to cps

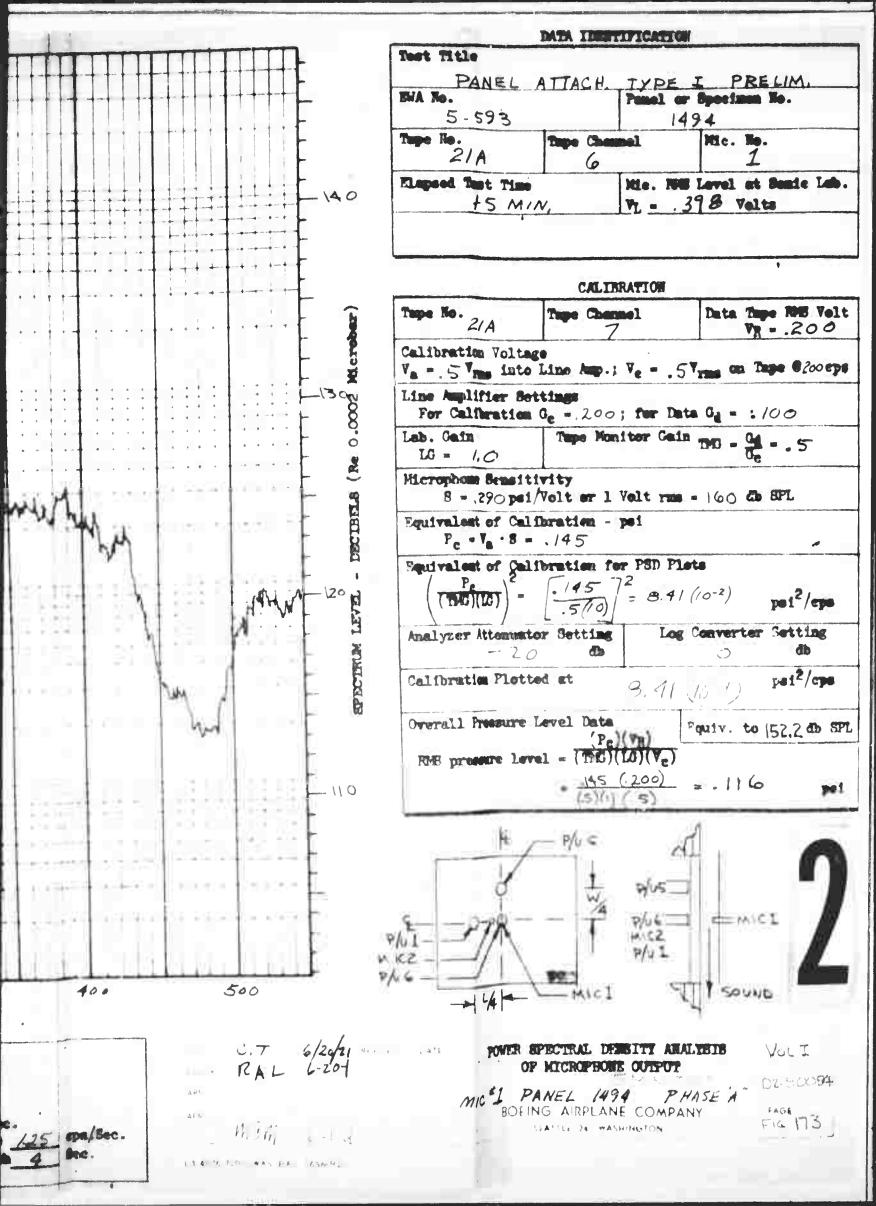


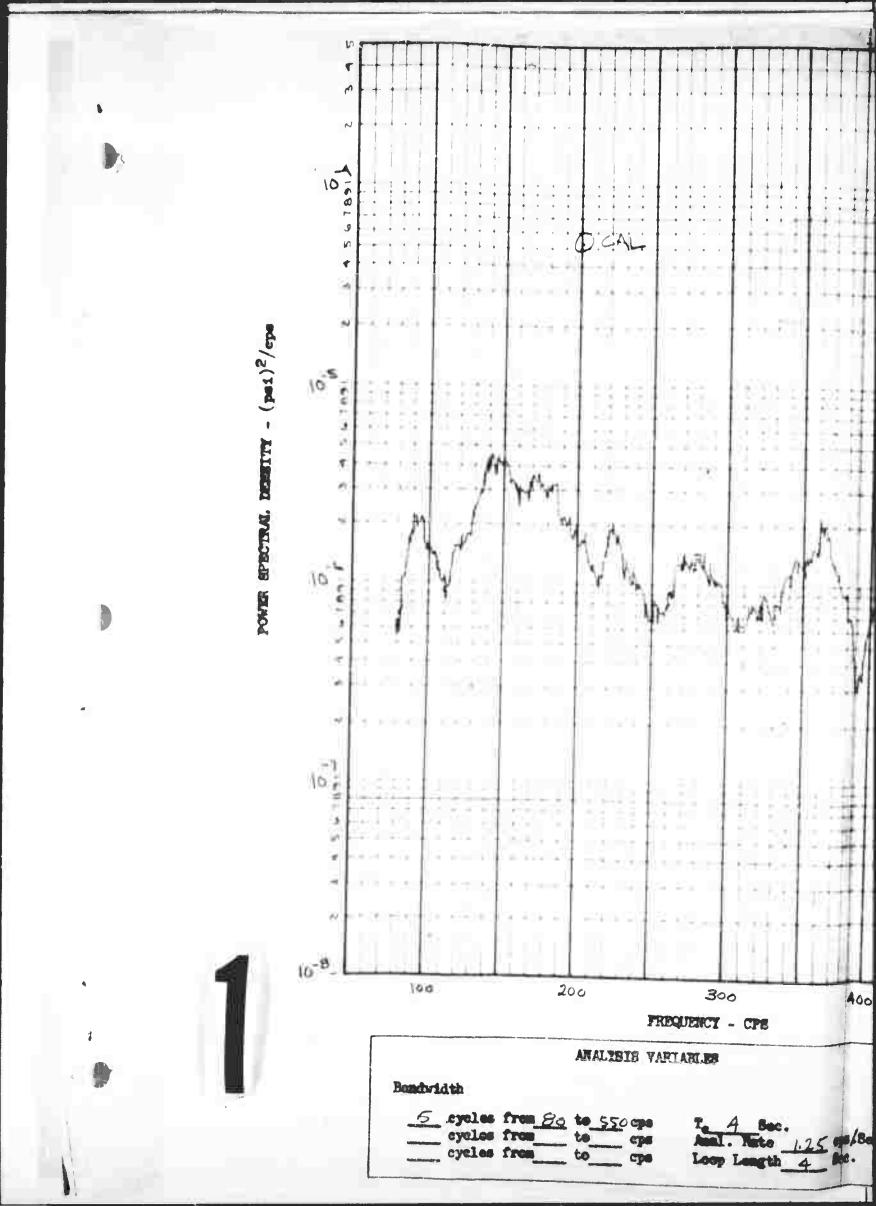


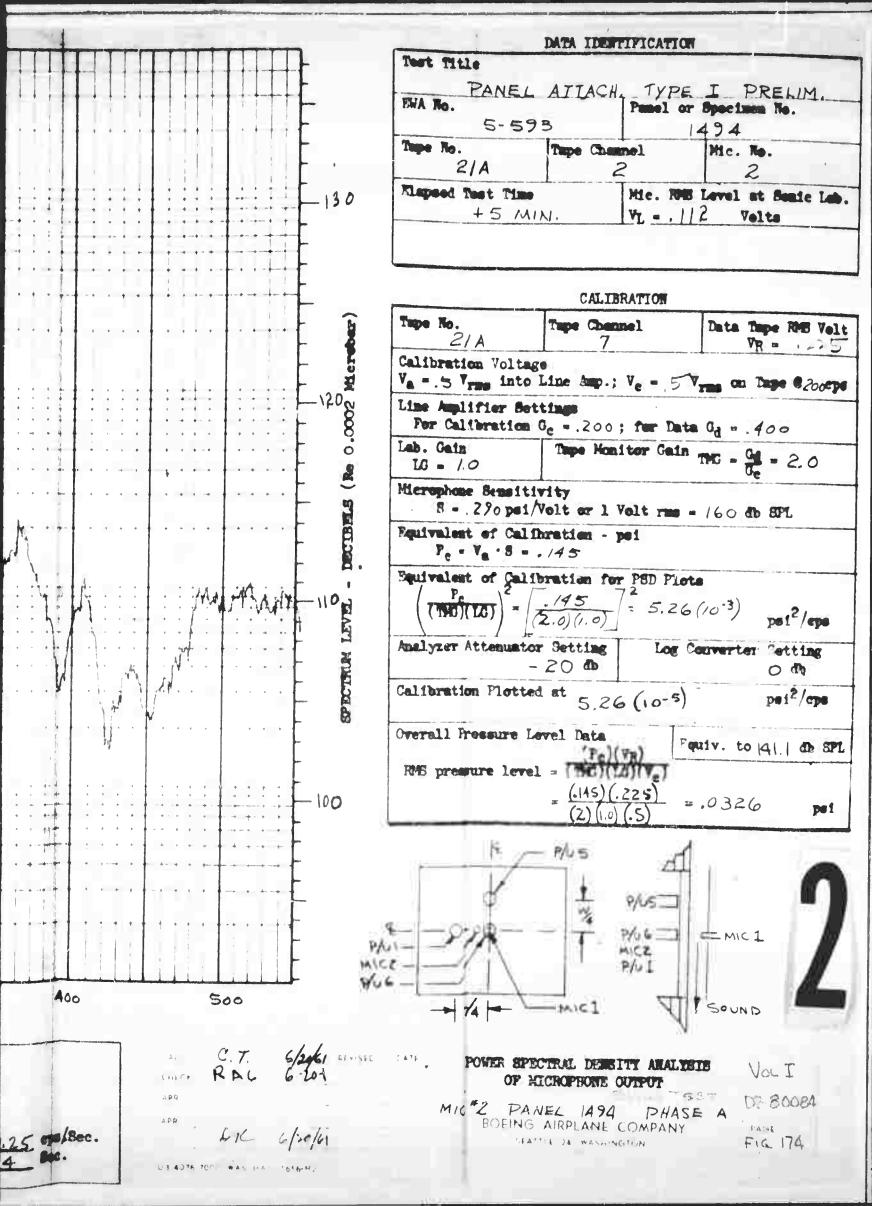
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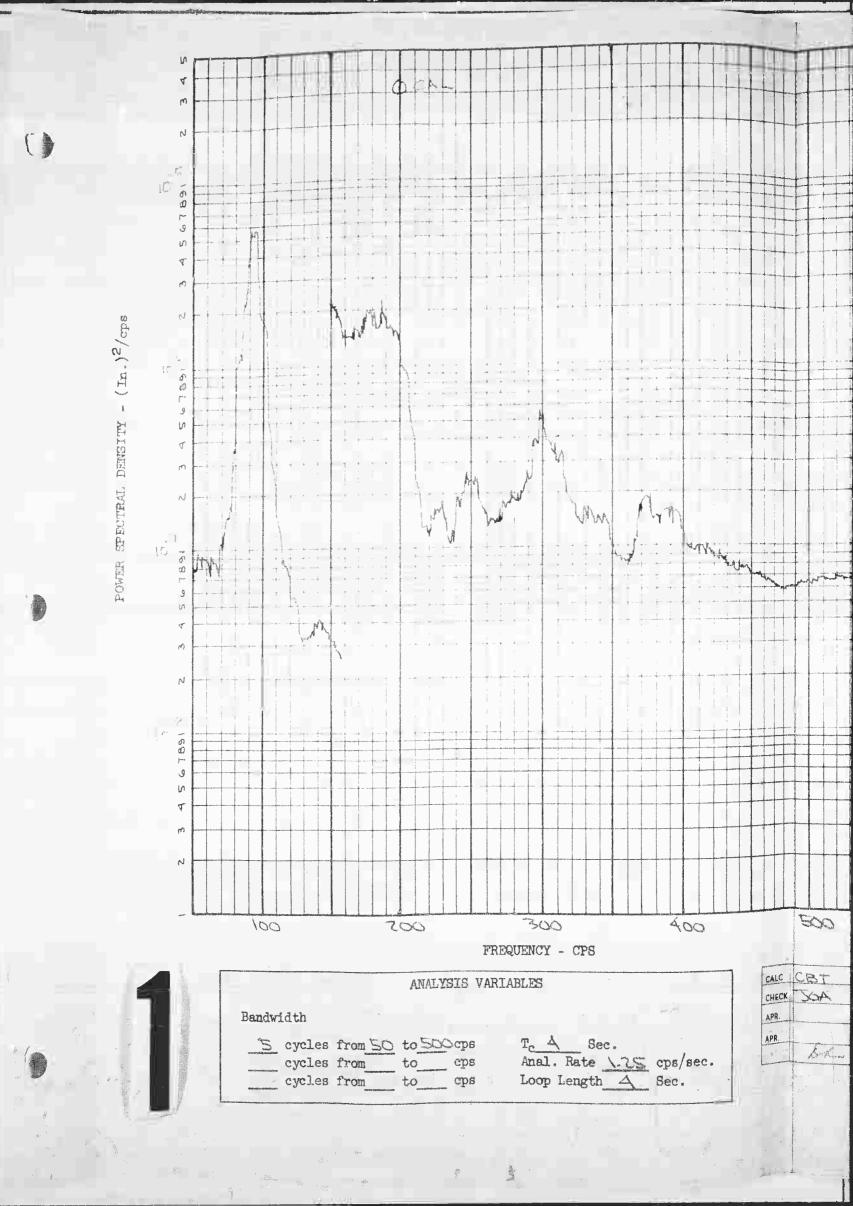


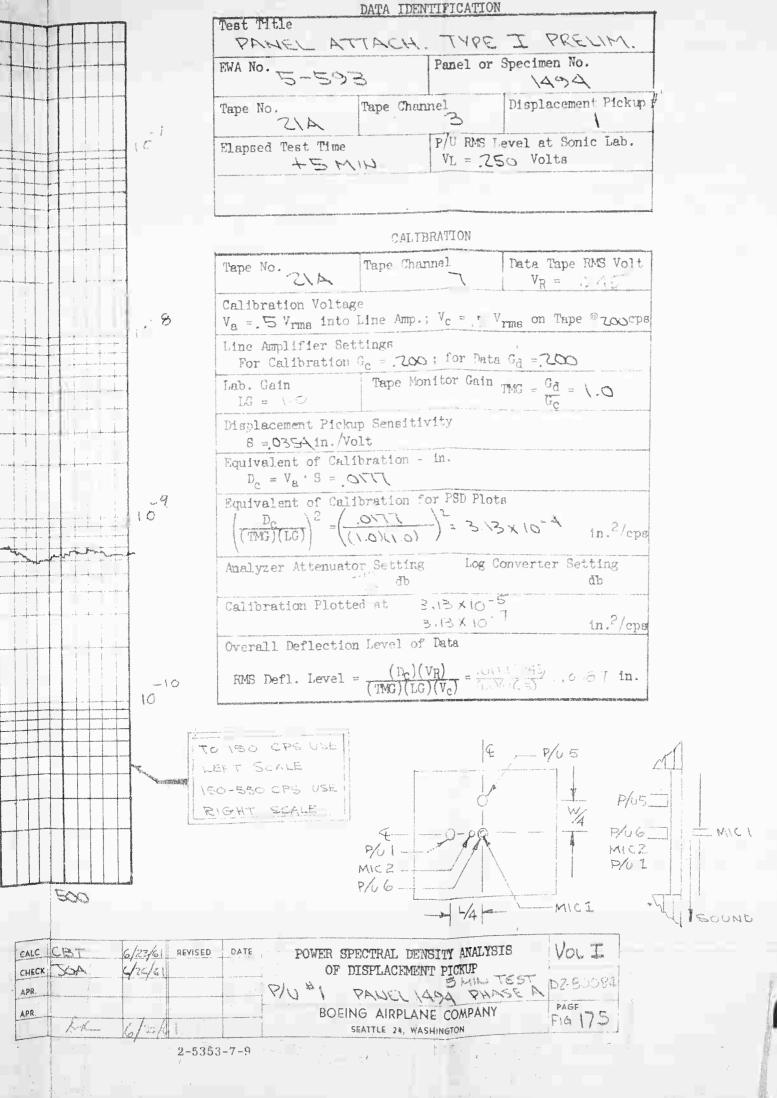


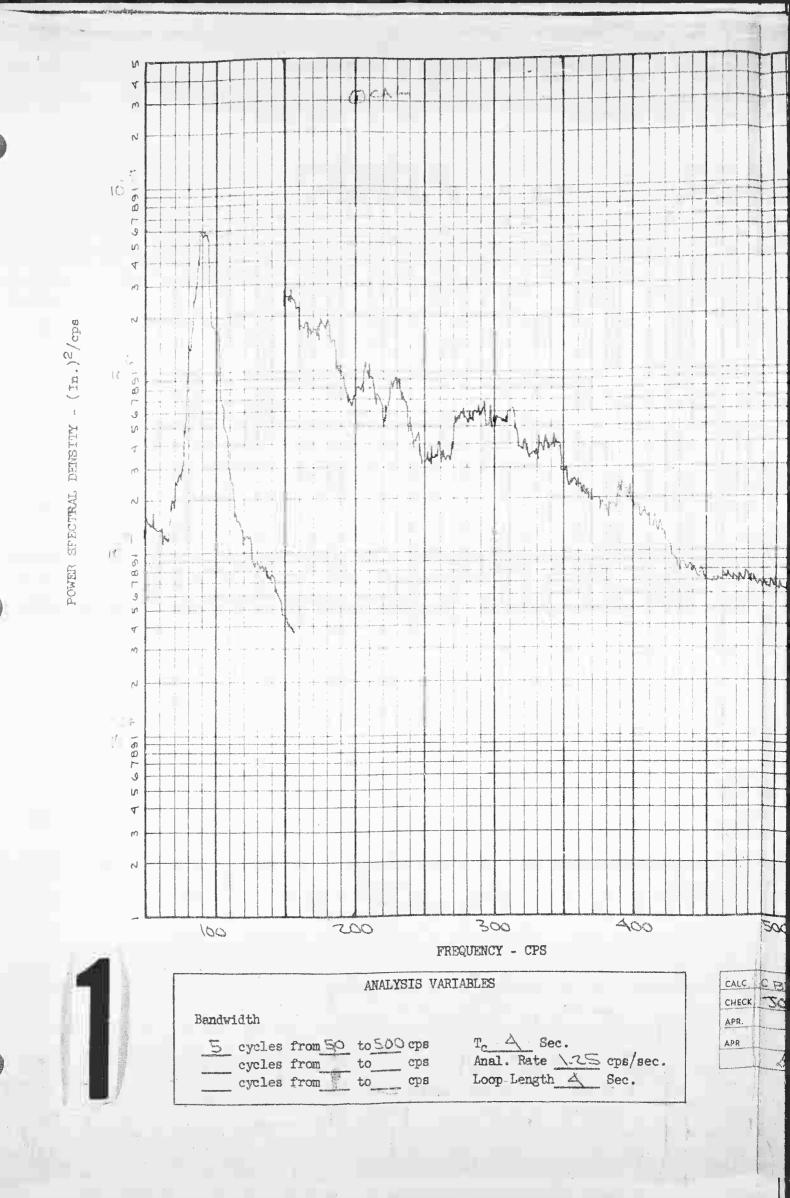


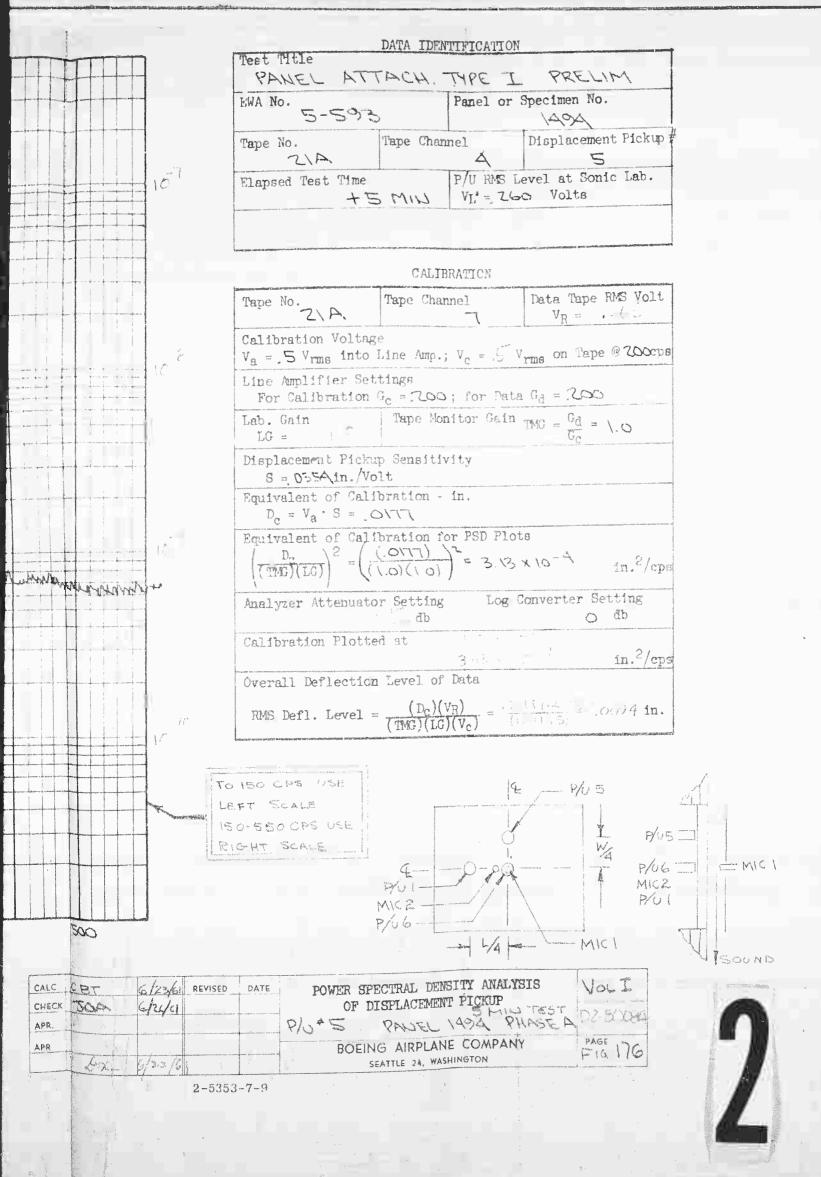


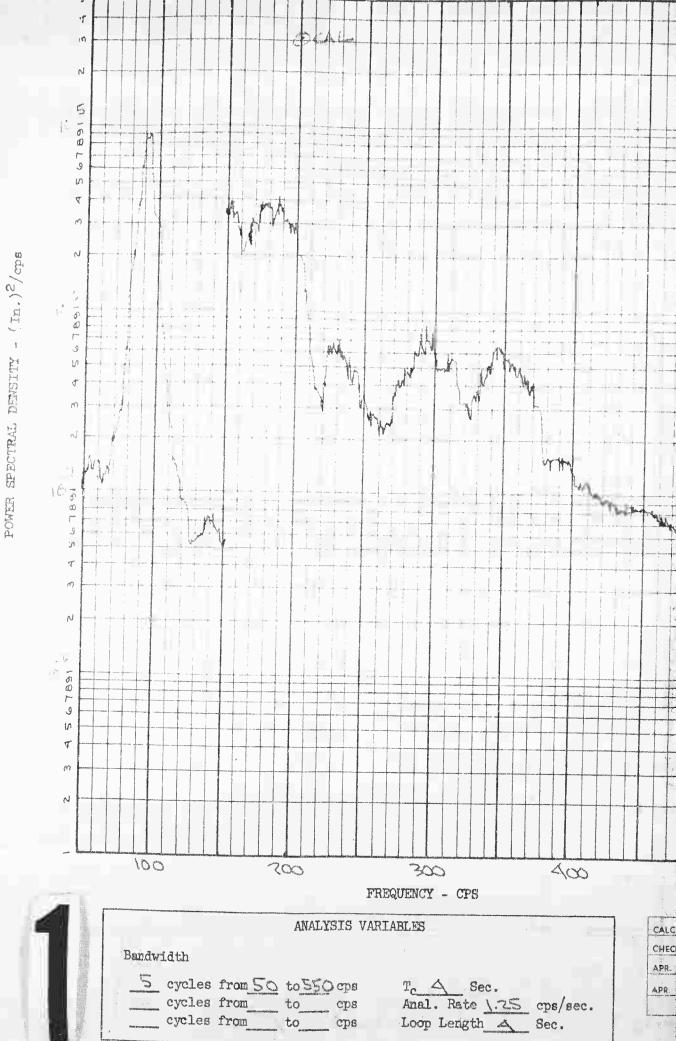




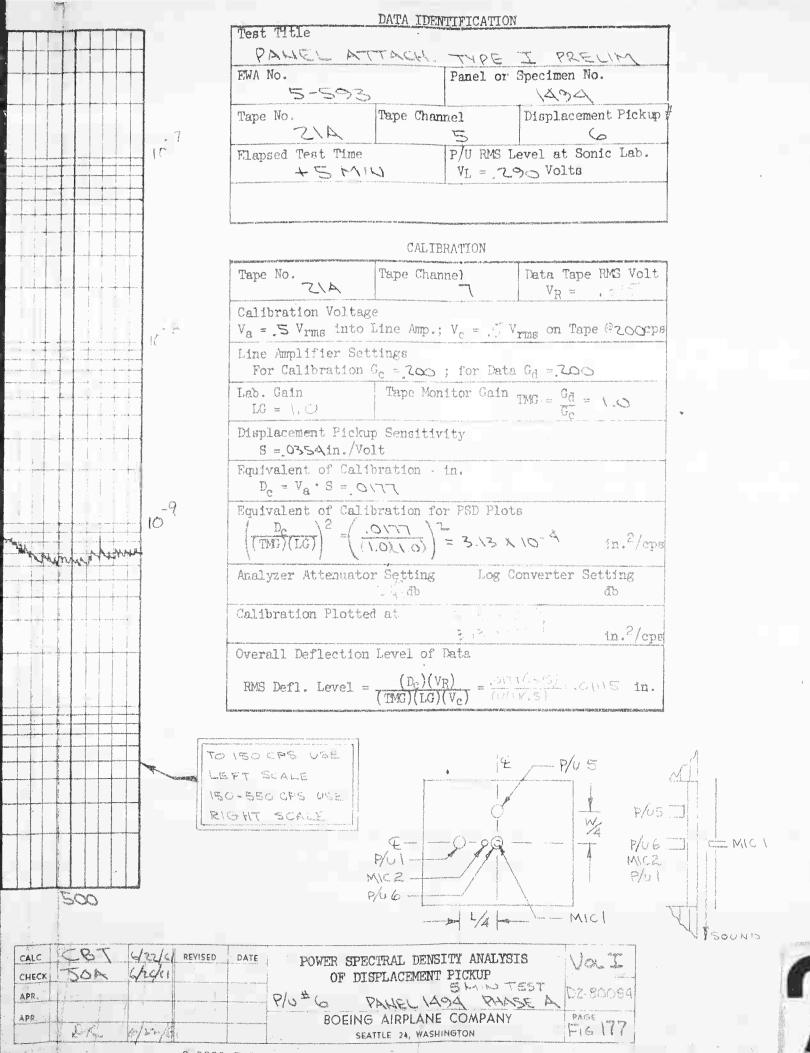








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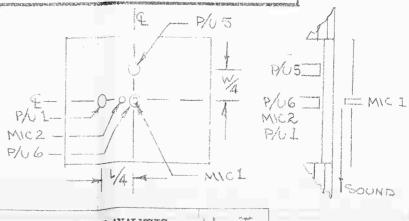
10 M 10-518816 GT89+8 1000 In 100 200 300 400 500 FREQUENCY - CPS ANALYSIS VARIABLES CALC CHECK Bandwidth APR. To A Sec.
Anal. Rate 1,25 cps/Sec.
Loop Length A Sec. cycles from to 550 cps cycles from to cps cycles from cycles from cps APR.

DATA IDENTIFICATION

Test Title		
EN WASTER WA	TAG G. TXEE	I PREMINI
EWA No.	Panel	or Specimen No.
5-592	- Agency by the control of the contr	1495
Tape No.	Tape Channel	Mic. No.
2_1	2	1
Flapsed Test Time	Mic. F	RMS Level at Sonic Lab.
at divers	LVI =	. A20 Volts
An angle of the Control of the Contr		The second states and second s
	,	

CALIBRATION

Tape No.	Tape Channel	Data Tape RMS Volt
Calibration Voltage Va = .5 Vrms into	e Line Amp.; V _c = 47	V _{rine} on Tape @236cps
Line Amplifier Set For Calibration ($G_{\rm c} = 100$; for Dat	a G _d = _ \ O O
Lab. Gain IC = 1.C	Tape Monitor Gain	$TMG = \frac{Gd}{Gc} = 1, C$
Microphone Sensiti S = .270 psi/	vity Volt or 1 Volt rms	= 160 db SPL
Equivalent of Cali	bration - psi	он Боод Б.Б.
Equivalent of California $\left(\frac{P_c}{(TMG)(LG)}\right)^2 =$	oration for PSD Plo $\left[\frac{.145}{(1)(1)}\right]^2$, 2.1	ts (10-2) psi ² /cps
Analyzer Attenuato	r Setting Log db Log	Converter Setting db
Calibration Plotte	d at 2.1 /10-4)	psi ² /cps
Overall Pressure L	$(P_C)(V_R)$	quiv. to 151.6 db SPL
**************************************	.14 5 (.355)	psi

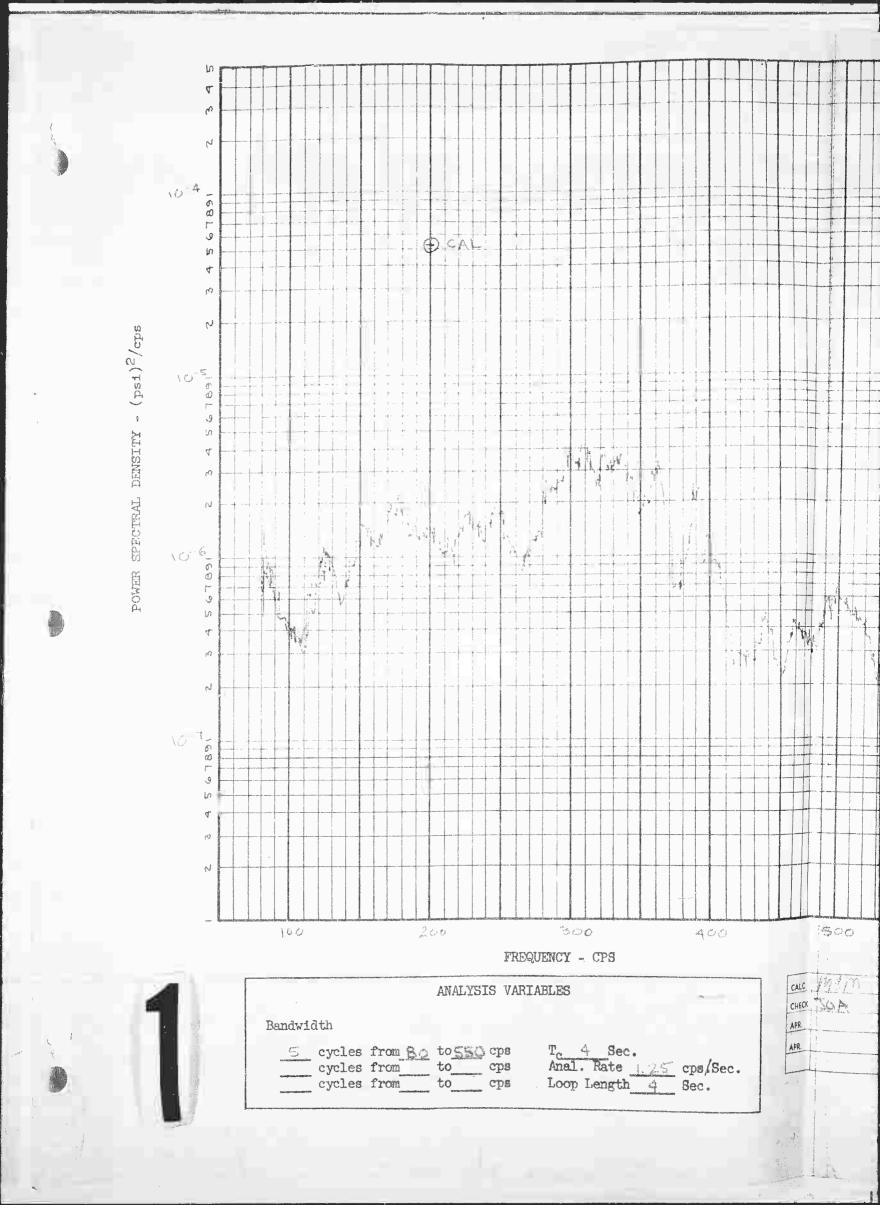


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AP	D	And the state of t	4 1	Triple of recommendants whose like it		5H12 TC31 1N7-90084
-	131	Ma paragraph reconstruction, proper of responses delighborrow		ga — ting AM alahaban satrafornir diplos beginnasang da		BOEING AIRPLANE COMPANY PAGE 7
API	R.	en de de se configura en productiva com en que transian en for acuado de productiva projectiva com en el transpolició de el				
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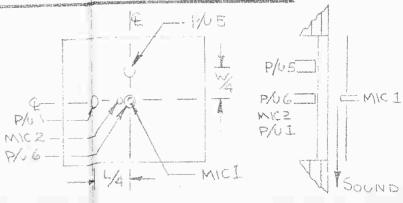


DATA IDENTIFICATION

Test Title PANTEL A EWA No.	TACH TYPE Panel or	T PRELIM Specimen No.
5-592	The mapper of the descriptions are related to the contract of	1495
Tape No.	Tape Channel	Mic. No.
Elapsed Test Time	1	Level at Sonic Lab. 6 Volts
# Control of Control o	and the state of t	at water lake find die der der de

CALIBRATION

Tape No.	Tape Channel	Data Tape RMS Volt VR = 200
Calibration Voltage	Line Amp.; $V_c = A \gamma V$	rms on Tapè @200ps
Line Amplifier Set For Calibration ($G_{\rm c}=\pi/0.0$; for Lette	. C _d = . 20 C
Lab. Gain LG = \.O	Tape Monitor Gain	TMG = $\frac{Gd}{Gc}$ = 2.0
	Volt or 1 Volt rms =	- 160 db SPL
Fquivalent of Cali P _c = V _a · S =		
(TAG)(LG)	bration for PSD Plot $\frac{145}{(2)(1)}$ 5.25 (psi ² /cps
Analyzer Attenuato	r Setting Log C	onverter Setting
Calibration Plotte	d at	psi ² /cps
Overall Pressure I	$-(P_C)(V_R)$	nuiv. to \AO. Cab SPL

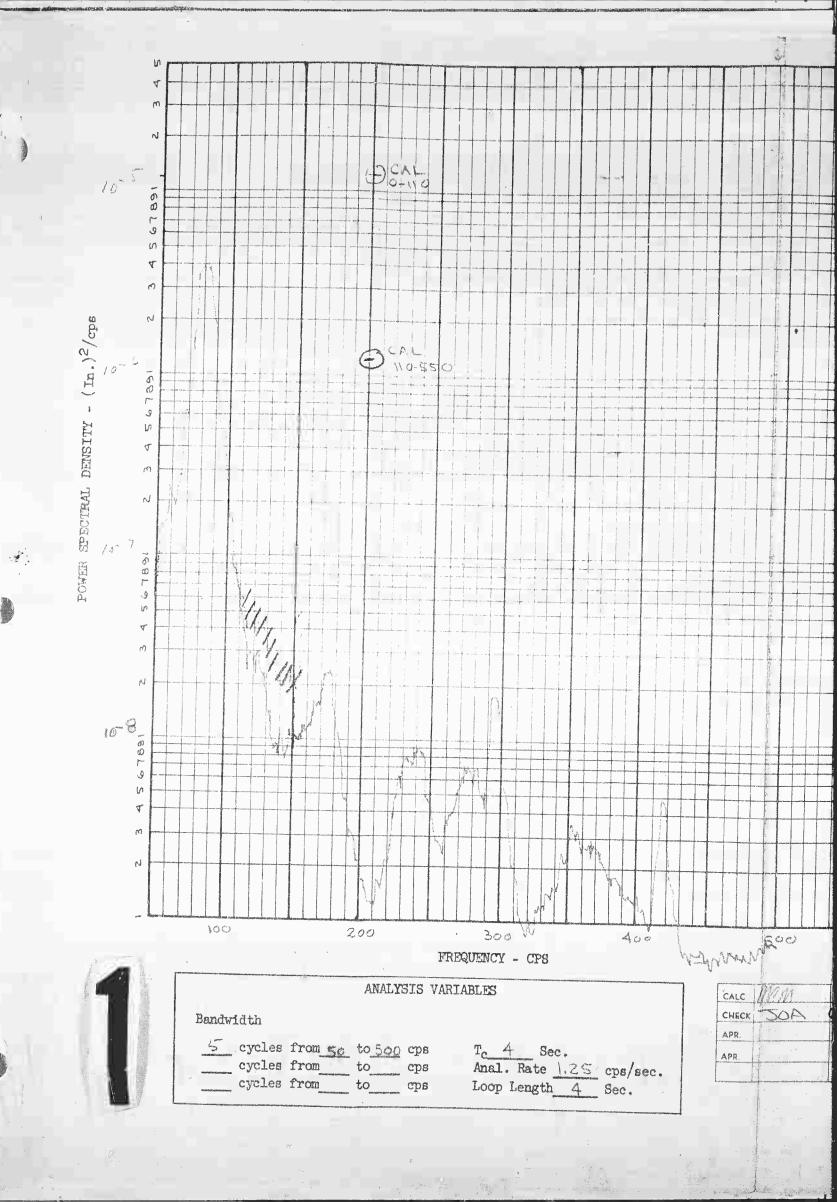


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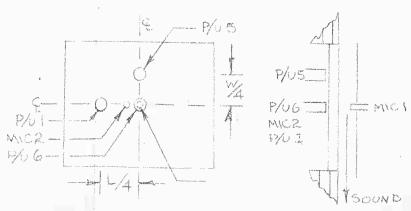
SPECITRUM LEVEL - DECIBELS (Re 0.0002 Microber)

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	DATA IDEN	TIFICATION	
Test Title			
PANEL ATT	ACH T	YPE I	PRELIM,
EWA No.			Specimen No.
5-59	3	14	95
Tape No.	Tape Chan	nel	Displacement Pickup
2004	4		1
Elapsed Test Time		P/U RMS Le	evel at Sonic Lab.
41M3+		AT = 1/3	Volts

Tape No.	Tape Channel	Data Tape RMS Volt						
	Calibration Voltage							
Va = 5 Vrms into I	Line Amp.; $V_c = \Delta \tau V$	rms on Tape @200cps						
For Calibration (Line Amplifier Settings For Calibration $G_c = .100$; for Data $G_d = .100$							
Lab. Gain LG = \.O	Tape Monitor Gain	$TMG = \frac{G_d}{G_c} = 1, O$						
Displacement Pickup S = .0707in./Vol	Sensitivity	r 1 a fin' n 1 agri a Banna an agus an Air af af ag she she she she ag she she ag a						
Equivalent of Calib		t ir 49-19-46 add 1900 talanda bet 190 aan oo						
Equivalent of Calib	ration for PSD Plot	C						
$\left(\frac{D_{C}}{(D_{C})(LG)}\right)^{2} = \left[\frac{1}{2}\right]$	0354] = 1.255	(10°3) in.2/cps						
Analyzer Attenuator	Setting Log Co	onverter Setting						
Calibration Plotted	at 1.255 C/c	5) 0-110 6) 10-55dn.2/cps						
Overall Deflection	Overall Deflection Level of Data							
RMS Defl. Level =	$\frac{(D_c)(V_R)}{(TMG)(LG)(V_c)} = \frac{(.03)}{(.10)}$	54)(117):,0087in.,						



MANNECO .	- 1 L/4
CALC MAM 60 RE CHECK SOR WOOLE	OF DISPLACEMENT PICKUP
APR.	POL PANEL 1995 PHASE A BOEING AIRPLANE COMPANY SEATTLE 24, WASHINGTON PAGE FIG. 180

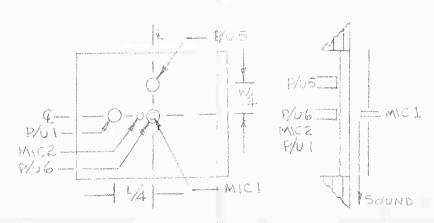
id CAL 1 dr 2 POWER SPECTRAL DENSITY - $(In.)^2/_{cps}$ 6.199.19 w 5.789L 4.7881 w W. FREQUENCY -ANALYSIS VARIABLES CALC MOVIN CHECK IS OA Bandwidth APR. 5 cycles from 50 to 500 cps T_{C} 4 Sec. Anal. Rate 1.25 cps/sec. Loop Length 4 Sec. APR. cycles from to cps cycles from to considerate cycles from

DATA IDENTIFICATION st Title

Test Mitle	a distance in the case of the		and the second s	
PANEL AT	TACH	エアを変	I PE	ELIM
EWA No.		Panel or	Specimen N	0.
Low Silvery to	>	14	95	
Tape No.	Tape Chan	nel	Displacem 5	ent Pickup
Elapsed Test Time	водинения по точко со учено наводений на почений на почений на почений наводили выполнений на почений наводили		evel at So 45 Volts	nic Lab.
Management (A) of proceedings (A) the description of the Angeles Angeles (A) of the Angel	ter, and seem a seem control to the	die er ein de kommen der eine der der der der der der der der der de	engeninde grant de service de la constant de la con	

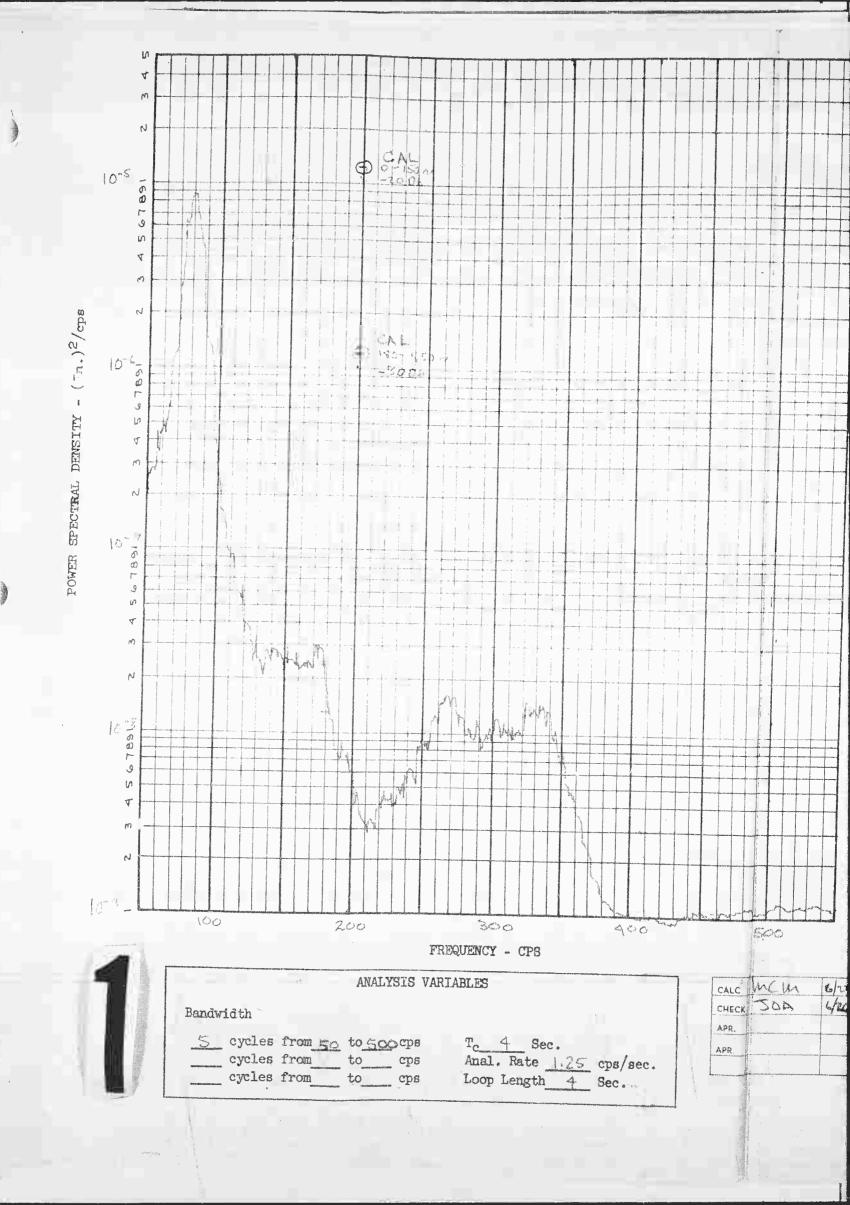
CALIBRATION

CANTINATION							
Tape No.	Tape Channel	Data Tape RMS Volt $V_R = 180$					
Calibration Voltage $V_a = .5 V_{rms}$ into Line Amp.; $V_c = 47 V_{rms}$ on Tape @2000cps							
Line Amplifier Set	ic = 0100; for Date	G _d = .100					
Lab. Gain LG = 1.0	Tape Monitor Gain	$IMG = \frac{G_d}{G_c} = 1.0$					
Displacement Pickup 8 = .Ololin./Vol							
Equivalent of Calib $D_c = V_a \cdot S =$	The state of						
$\left(\frac{D_{c}}{(TMG)(LG)}\right)^{2} = \left(\frac{D_{c}}{(LG)}\right)^{2}$	cration for PSD Plot	5 (10 ⁻³) in. ² /cps					
Analyzer Attenuato	r Setting Log C	Converter Setting O db					
Calibration Plotte	1 at 1,255 (0,7)	110 cox y in.2/eps					
Overall Deflection	Level of Data						
RMS Defl. Level =	(D _C)(V _R) (TMG)(LG)(V _C)	SALATA O SO In . (41)					



CALC	11644	6.23	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	VOLT
CHECK	<u> 200 - </u>	42461	e en historic variationalist transcriber school et describer and	Programina and American	OF DISPLACEMENT PICKUP	107-AVV-1
APR.	the state of the s		and the state of t	and the special contract of the state of the	P/US PANEL 1495 PHASE A	See the Section of the Sec
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and the second	. '				SEATTLE 24, WASHINGTON	And the second s

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Test Title

PANEL ATTACH TYPE T PRELIM

FWA No.

Panel or Specimen No.

495

Tape No.

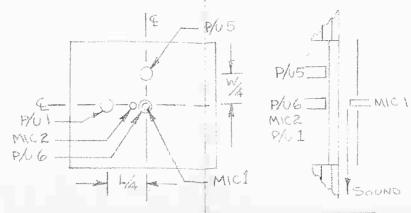
Tape Channel

Displacement Pickup

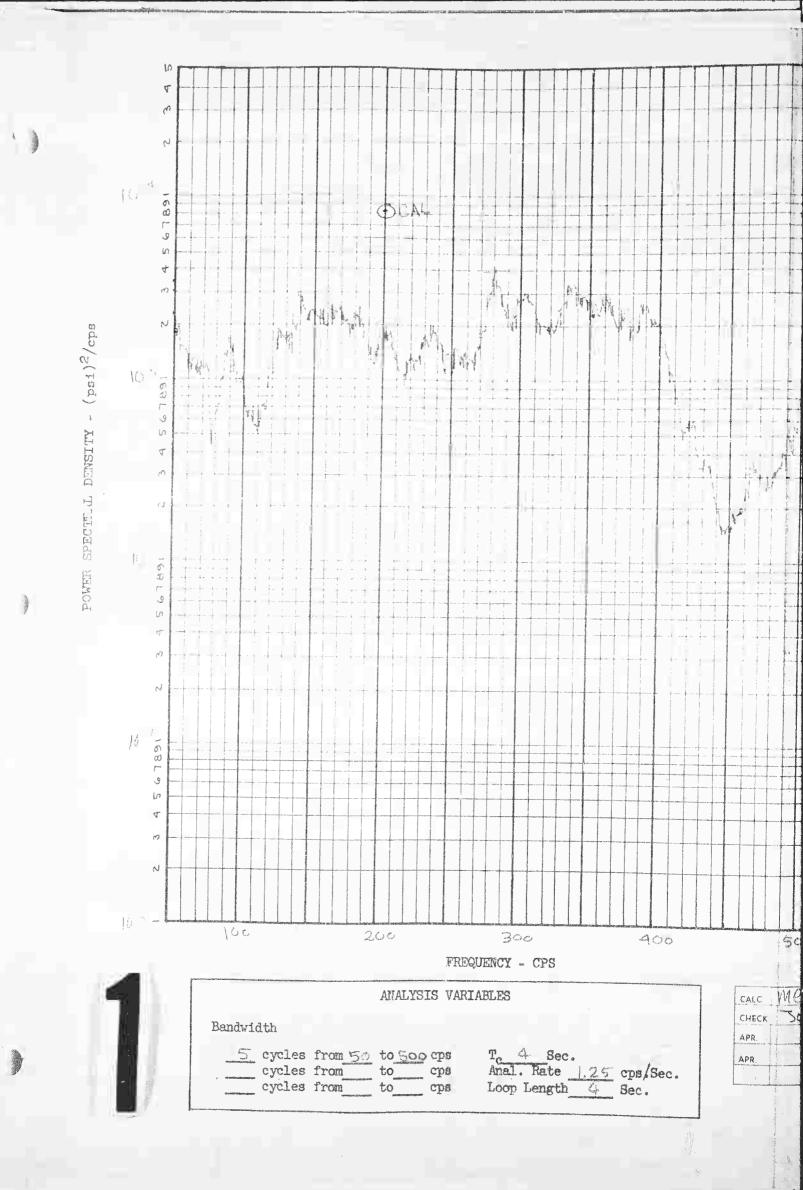
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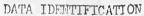
VL = 180 Volts

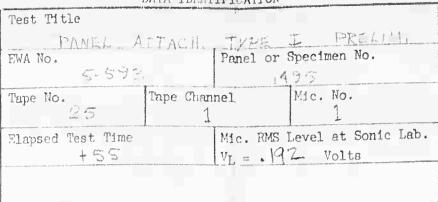
Tape No.	Tape Channel	Data Tape RMS Volt VR = . 155
Calibration Voltage Va = .5 V _{rms} into I		O ^V rms on Tape © 20⊖cps
Line Amplifier Sett	$R_{\rm c} = 100$; for D	ata G _d = ,100
Lab. Gain LG = (. C	Tape Monitor Ga	$ \operatorname{Im} \operatorname{TMG} = \frac{G_{\operatorname{d}}}{G_{\operatorname{C}}} = 1.0 $
Displacement Pickup S = .0707in./Vol		
Equivalent of Calib		
Equivalent of Calib	ration for PSD P	lots
$\left(\frac{D}{(MG)(LG)}\right)^2 = \left[\frac{1}{2}\right]$	(1)(1) [1.29	5 (10 ⁻³) in. ² /cpa
Analyzer Attenuator	Setting Log	Converter Setting O db
Calibration Plotted	1 at 1.255 (10	5) 6-750 6) 150-260 in. ² /cps
Overall Deflection	Level of Data	
RMS Defl. Level =	$\frac{(D_{c})(v_{R})}{(IMG)(LG)(v_{c})} = \frac{1}{2}$	3354 (155) CONT In.



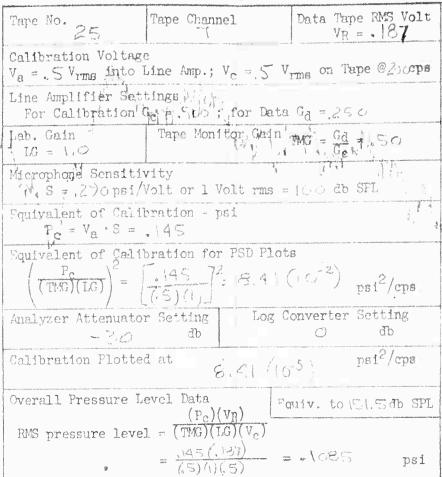
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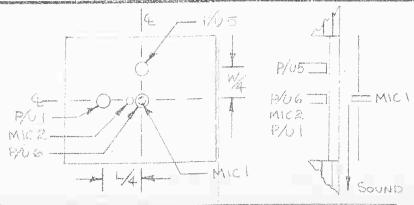






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CALC	Mem	6-23	REVISED C	DATE	POWER SPECTRAL DENSITY ANALYSI	s Volt
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APR.	t grander for the light of the first plan super-section to the analyse and the sales of the sale	accompliance of distance of	and the state of t		MIC I PANEL 1495 PHA	SE DIX DOLLOW
APR.	general design plantiful planting some some planting reasons are not suppressed as some real		Methy wateria all excluduetos truj regregiose ja laga		BOEING AIRPLANE COMPANY SEATTLE 24, WASHINGTON	PAGE 183
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LEVEL

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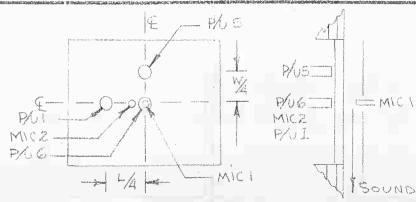
n Ć. ca 2 18819 10 DAL. ın 4 N POWER SPECTRAL DENSITY - (ps1)2/cps O LO. T 107 67891 M rj. 5 6789 in m N 100 200 300 500 900 FREQUENCY - CPS CALC TO GE IN ANALYSIS VARIABLES 50A CHECK; Bandwidth APR. T_c 4 Sec.
Anal. Rate \25 cps/Sec.
Loop Length 4 Sec. 5 cycles from 80 to 550 cps
cycles from to cps
cycles from to cps APR.



Test Title			
EWA No. 5-593		Panel or	T 1-RECIM. Specimen No.
Tape No.	Tape Chan	nel	Mic. No.
Flapsed Test Time		Mic. RMS 1	Level at Sonic Lab. Volts

CALIBRATION

	AHITDU	11111111		
Tape No. 25	Tape Chann	el	Data Tape RMS VR = .228	
Calibration Voltage Va = .5 Vrms into I		V _c = .5 V	rms on Tape @/Co	Cps
Line Amplifier Settler For Calibration (G = .500;	for Data	. G _d = 1.000	
Lab. Gain LG = \. O	Tape Mon1	tor Gain	$TMC = \frac{GA}{Gc} = 2.00$	כי
Microphone Sensitiv		olt rms =	160 db SPL	
Equivalent of Calib $P_c = V_a \cdot S = .$		61	neg eg gazarnalgen mit antagate fear villen - dibanisis men skipler i misse 1984 i 1984 i 1984 i 1984 i 1984 i	Zerojo _ utilizad_conventible Montel-eta (montel
Equivalent of Calib)8
Analyzer Attenuator	Setting db		onverter Setting	5
Calibration Plotted	1 at 57, 2,5	× 10	6 pai ² /cr	e
Overall Pressure Le	evel Data (Pc)(v _R) [Fo	nuiv. to \4\. 3 db	SPL
RMS pressure level	$= (TMG)(L)$ $= \frac{.145}{(2)(1)}$		1880.	osi



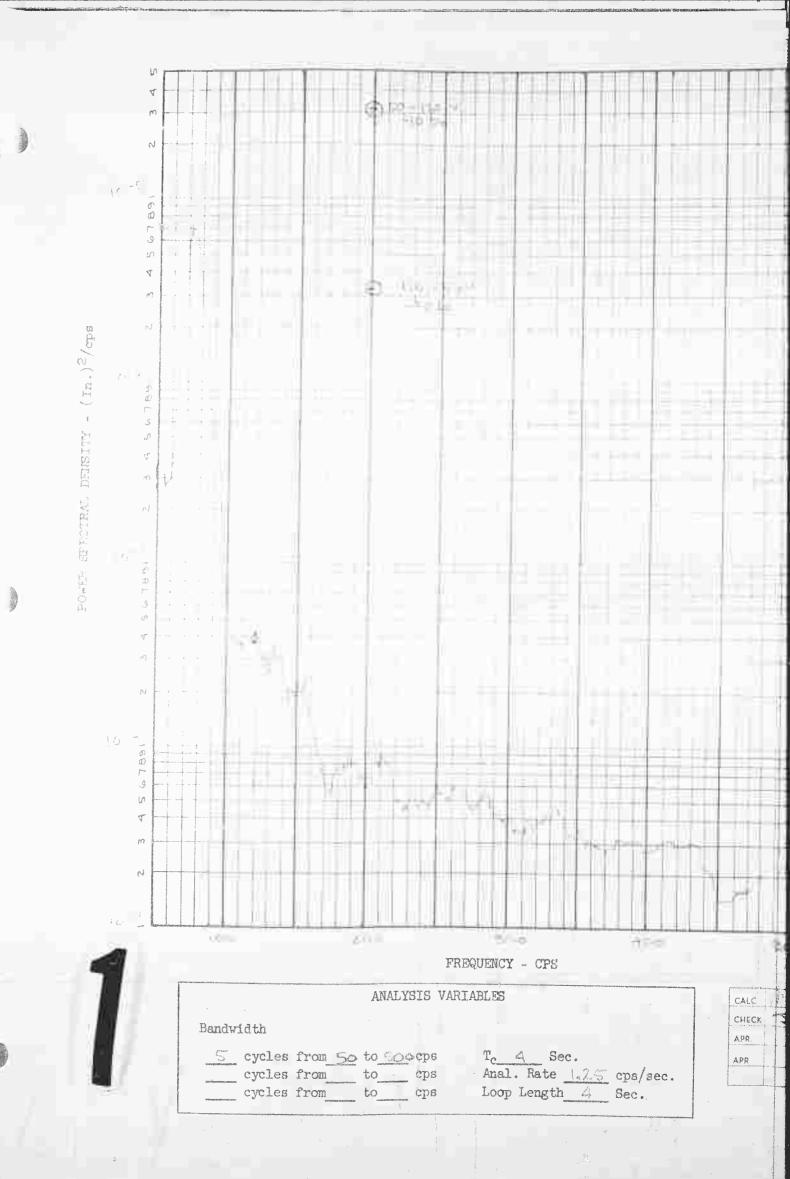
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CALC	13	66873	6-24:57	REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS	nin i
CHECK		56A	Urda		7	OF MICROPHONE OUTPUT	Culture.
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	1	the second secon		0.606		SEATTLE 24, WASHINGTON	

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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Mcrobar)



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Test Title

PANSA ATTACH TVDE I PROBLEMA No.

Famel or Specimen No.

Panel or Specimen No.

14 75

Tape No.

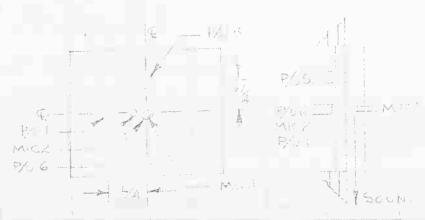
Tape Channel

Displacement Pickup

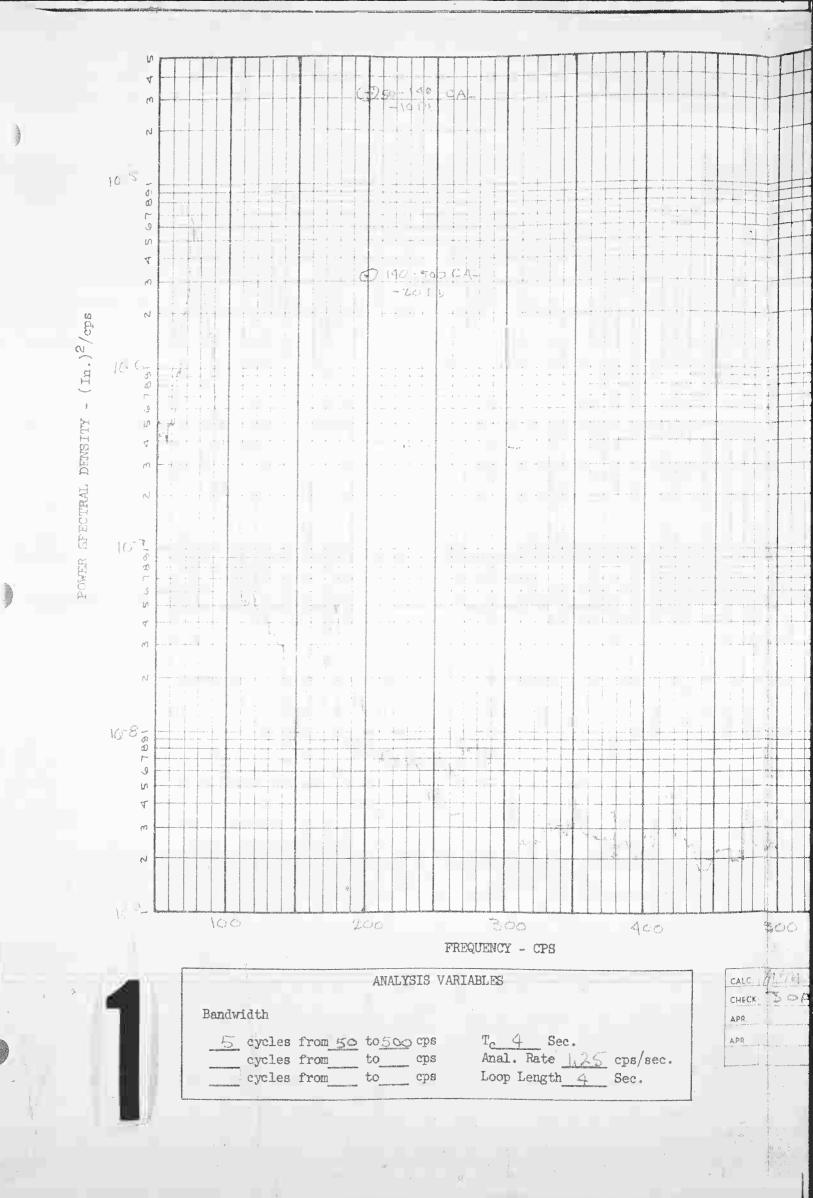
P/U RMS Level at Sonic Lab.

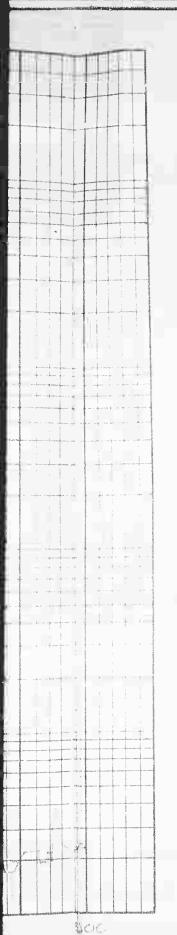
VL = 270 Volts

Tape No.	Tape Channel	Data Tape PMS Volt
Calibration Voltage Va = 5 Vrms into	e Line Amp.; V _c 5	rms on Tape @200 cps
Ine Ammiliar Set	tings Ger Soor for D	ata Gd = . C) (C
Lab. Gain	Tape Monitor Ga	$\frac{dn}{dr} = \frac{Gd}{Gc} = \frac{1}{1} + \frac{1}{1}$
Displacement Picku S = .cm 4 ip./Vo	lt	
Equivalent of Cali	hration - in.	The second secon
Equivalent of Call	bration for I'SP F	lots
	(C) (T)	
Analyzer Attenuato	db	og Converter Setting
Calibration Plotte	C. 3.1 1 - 1 - 1 - 1	
i i		2 - Pors
Overall Deflection		
RMS Defl. Level =	$\frac{(D_{C})(V_{R})}{(TMG)(LG)(V_{C})} =$	TTT a



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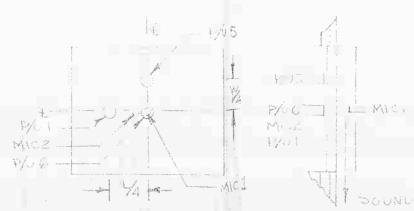




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Test Title	6	A CONTRACTOR OF THE PERSON NAMED IN CONT	**************************************		
TPANE: A	TIMALI	17/1	T-10126/11		
EWA No. 5-50	g Salah Salah Sala	[Specimen No.		
Tape No.	Tape Chan	nel	Displacement Pickup		
25	4		f politicas heres in		
Elapsed Test Time		P/U RMS L	evel at Sonic Lab.		
den Con Control	man a make him V N MA M in behavior a Adelysicalist symmetri	AT = '3'	C) C Volts		
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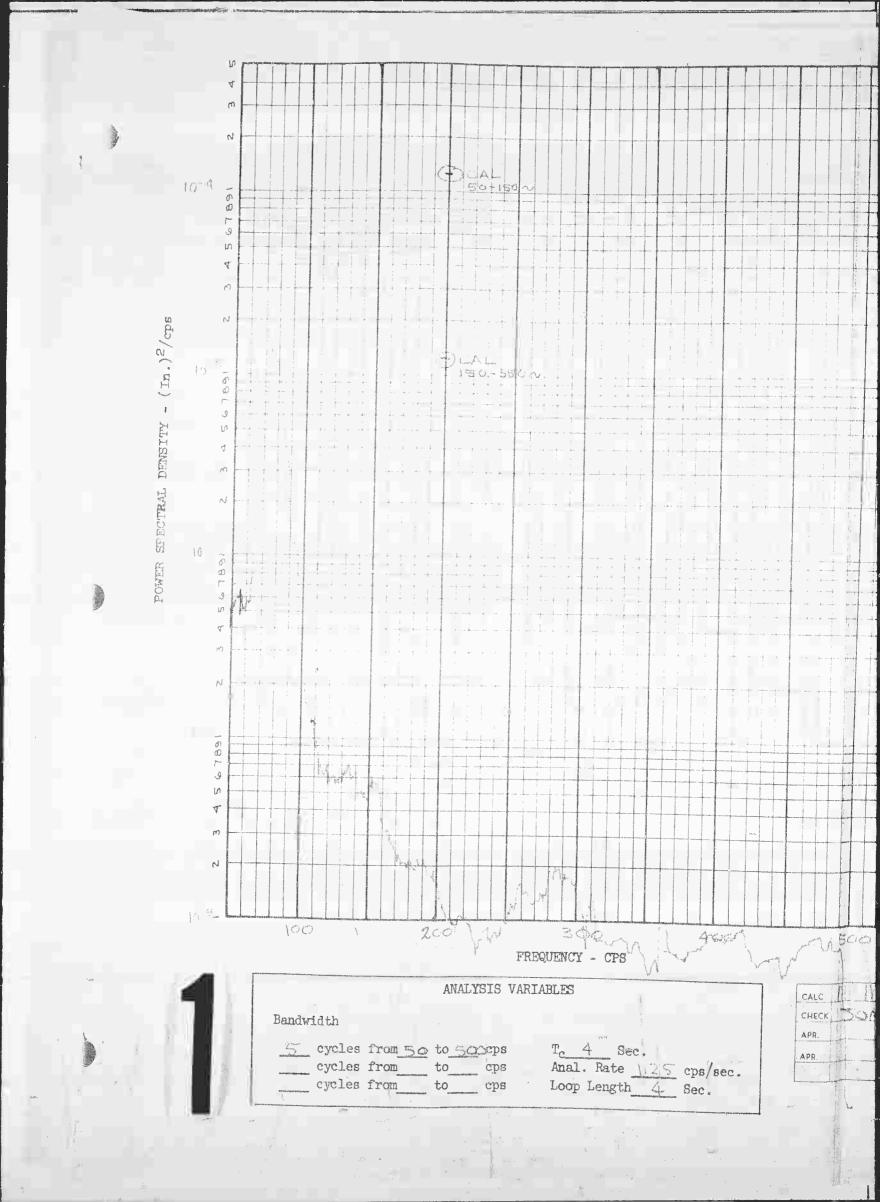
паре No a	Tape Channel	Data Tape RMS Volt
Va = . S V _{rms} into		V _{rms} on Tape @ Zcccps
Line Amplifier Set For Calibration	$G_0 = 500$; for The	ata G _d = .5cm
Lab. Gain LG = 1, C	Tape Monitor Ga	$ \text{In } _{\text{TMG}} = \frac{\text{Cd}}{\text{U}_{\text{C}}} = 1, $
Displacement Picks S = 6304n./Ve	olt	
Equivalent of Cal	CITI	
Equivalent of Cal	ibration for PSD PI	Lots
	3177772 3.13	
Analyzer Attenuat	4 5 00	Converter Setting
Calibration Plott	ed at + 5 10.5)	in. ² /eps
Overall Deflection	n Level of Lata	and the second sec
RMS Defl. Level	$= \frac{(D_c)(V_R)}{(TMG)(LG)(V_c)} = \frac{1}{2}$	
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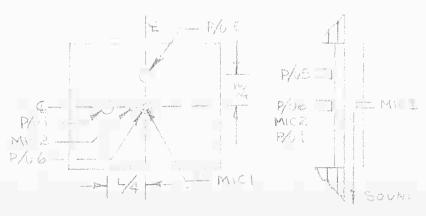
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DATA IDENTIFICATION				
Test Title				
FRANKL AT	TACH	To look	r PRELIM	
EWA No.	The second secon	Panel or	Specimen No.	
5-593		11 12	195	
Tape No.	Tape Chan	nel	Displacement Pickup	
And the second	(4)		6	
Elapsed Test Time	The second secon	P/U RMS L	evel at Sonic Lab.	
perfective and the second		VL = . 3	7C Volts	
And the state of t	The second secon	Afters a security of experience for the experience of the experien	and American State of the Control of	

generalises and transfer and transfer at 1 years of the 10 yea	promised Compared to the first indicate any operation of the behavior as the form of the contract of the contr				
Tape No.	Tape Channel	Data Tape RMS Volt $V_R = 1.210$			
Calibration Voltage $V_a = \sqrt{5} V_{rms}$ into I		V _{rung} on Tape 9200cps			
Line Amplifier Sett For Calibration C	$G_c = .500$; for Dat	a Ga = .2.50			
Lab. Gain LG = O	Tape Monitor Gain	TMC = Gd = TM C			
Displacement Pickup Sensitivity S = .0354in./Volt					
Equivalent of Calib		,			
Fquivalent of Calibration for PSD Plots $ \left(\frac{D_{c}}{(TMG)(LG)} \right)^{2} = \frac{0.0117}{(.5)(1)} + 1.25(10^{-7}) \text{ in } \frac{2}{cps} $					
Analyzer Attenuator	đb	db db			
Calibration Plotted at (.2.5 \ 10 - 4 (50 - 30) \ (.2.5 \ 10 - 5 (140 - 50) \rm 1.2/cps					
Overall Deflection Level of Data					
RMS Defl. Level = $\frac{(D_c)(V_R)}{(TMG)(LG)(V_C)} = \frac{(D_c)(V_R)}{(D_c)(LG)(V_C)} = \frac{(D_c)(V_R)}{(D_c)(D_c)} = \frac{(D_c)(V_R)}{(D_c)} = \frac{(D_c)(D_c)}{(D_c)} $					



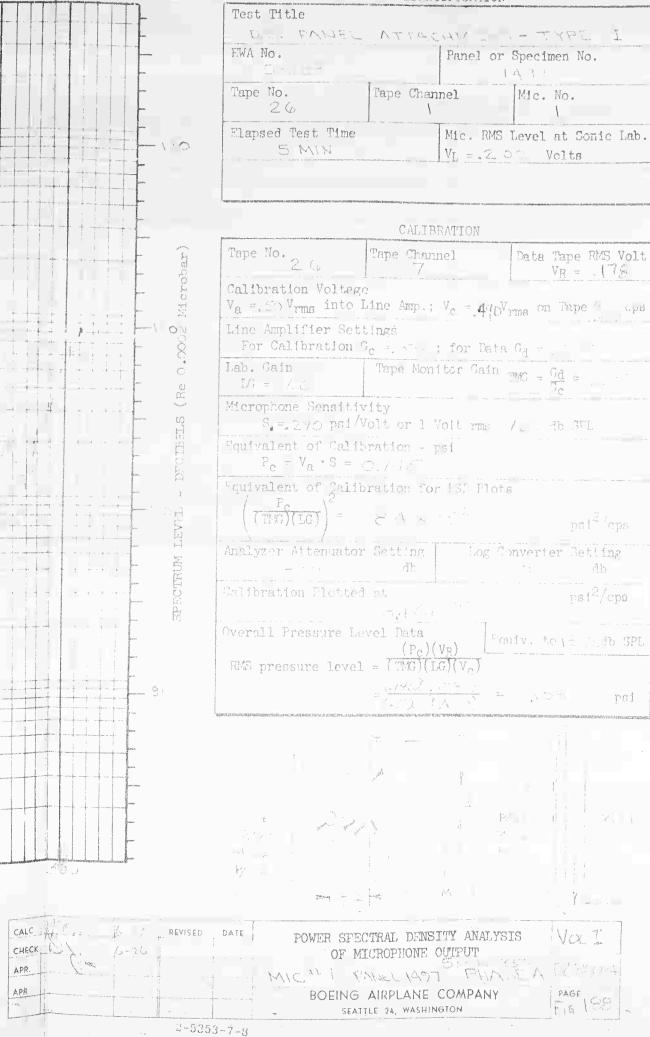
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SEAT	TLE 24, WASHINGTON FIG. 101

40211.4 4.5 FREQUENCY - CPS CHECK

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				ANALYS:	IS VARIA	BLES	in yang gang ammandan kembanahan kelabupan kecentah yang delam	Fife of Briss School approximately "available of	arens den generalen stellen men en e
Bone	lwidth						e .		
DOUG	TM TH MI				5- 14 ge				
distribut	су	cles	from 50 from from	to	cps	Anal.	Rate	25	cps/Sec.
disassons	maniners 5 3	- T. C.D	T T (MI)	ro	cps	Loop 1	Length	wash wakamaniwania	Sec.
And the second s	Carried and Service special of the Contract of	AND SECURITION OF THE PARTY OF	M 4 M - elemente como como de la hape, con cui a single-partir promo de descripción.	minima ang maginai manana maninda an distributa ang magangar mga garan-ay	Complete Com	Contraction of the Contraction			

POWER SPECTRAL DENSITY - (psi)2/cps

APR.



In Ų. 000 700 FREQUENCY - CPS ANALYSIS VARIABLES CALC CHECK Bandwidth cycles from to to cps T_c 4 Sec.

cycles from to cps Anal. Rate /.20 cps/Sec.

cycles from to cps Loop Length 4 Sec.

OF MICROPHONE OUTPUT MIC" & PANNE HAT PHATE A DE RICH! 1 PAGE BOEING AIRPLANE COMPANY 4 (2.3 SEATTLE 24, WASHINGTON

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FOWER SPINCRAL DENSITY - (In.)2/ops FREQUENCY - CPS ANALYSIS VARIABLES Bandwidth

CALC TILL

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DATA IDENTIFICATION Test Mile D.S. FALLL Panel or Specimen No. EWA No. Displacement Pickup Tape No. Tape Channel P/U PMS Level at Sonic Lab. Flapsed Test Time V_I = - Volta Short I want to be a second CALIBRATION Tape Channel Data Papa RMS Volt Tape No. Calibration Voitage Va = Vrns into line Amp.: V. 1295 rns in ore , cos no Amplituter Services For Salitratic in in 19 11 19 19 19 19 Lab. Sain Pay Moniter Sain 34. daplacement Pickup Genetalvity S . J. C. Sin. Wolt privalent of Calibration - in log onverter the g. all Deflection and of Date. HMS Defi. Level (TMG)(LG)(V. 1 20 WI CALC MONTH CONTRACTOR DATE POWER SPECTRAL DENSITY ANALYSIS Vac I OF DISPLACEMENT PICKUP

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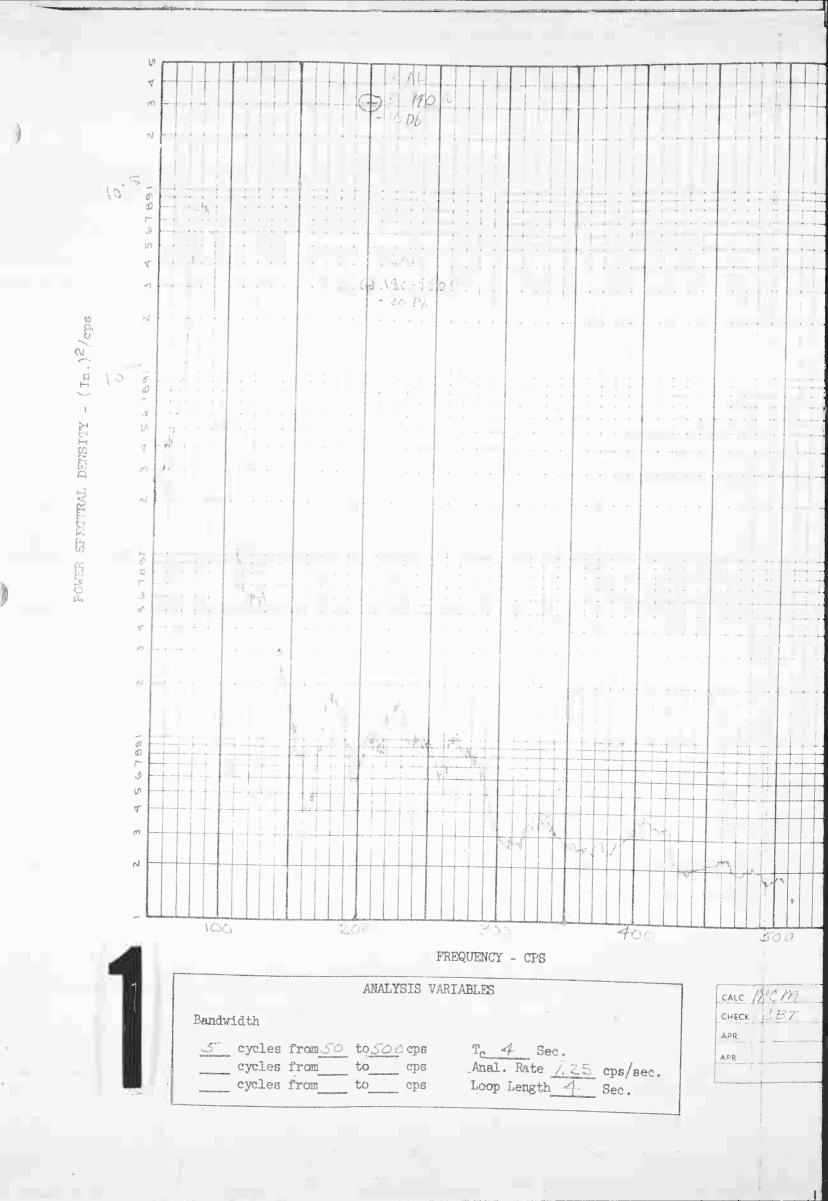
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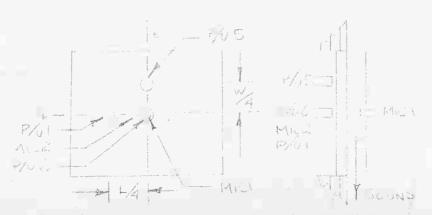
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Test Title	And the second s	Manager January
D.S. FAME	NI A HME	to the men of her first fine for
FWA No.		or Specimen No.
Tape No.	Tape Channel	Displacement Pickup
Elapsed Test Time		4S Level at Sonic Lab.

CALIBRATION

Tape No.	Tape Channel		e RMS Volt
Calibration Voltage Va = 5 V _{rms} into I	e Line Amp.; V _e	= 470 ms on Te	pe o cys
Line Amplifier Set	tings In = Soot for	r Deta Ca = -	
Lab. Gain LG = /.O	Tape Monitor	Gain TMG = Gd	The Case of the State of the St
Displacement Pickup S = 03 % in./Vol	5.4		
Equivalent of Calib			
Equivalent of Calib	pration for PS	D Plots	
$\left(\frac{D_{C}}{TMG}\right)(LG)^{2}$	2.04.X\G	. • \	in. ² /epa
Analyzer Attenuator	r Setting db	Log Converter	Setting ab
Calibration Flotte			1n.2/cps
Overall Deflection	Level of Data		
RMS Defl. Level =	$(D_c)(V_R)$ $(TMG)(LG)(V_c)$	San Carlo	way of the state of



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CHECK 287 421/61	OF DISPLACEMENT PICKUP	to a constant
APR.	P/U"5 PAUL MOT PHATE A	
APR	BOEING AIRPLANE COMPANY	FIGE 191
	SEATTLE 24, WASHINGTON	ituital all

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SPECTRAL DENSITY - (In.)2/cps 10 0 POWER 100 200 400 FREQUENCY - CPS ANALYSIS VARIABLES 1 BT CALC CHECK Bandwidth APR. Tank Sec. 5 cycles from 50 to 500 cps Anal. Rate 4.75 cps/sec. cycles from to cps Loop Length 4 Sec. cycles from to cps

Test Title

S. PANEL ATTACHMENT - TYPE I

EWA No.

Panel or Specimen No.

Tape No.

Tape Channel

Co

Flapsed Test Time

Displacement Pickup

VL = 270 Volts

CALIBRATION

Tape No.	Tape Channel		ata Tape	RMS Volt
Mark and control of control of the c			The same consequence	2 2
Calibration Voltage	2	5 T 44	171	
Va = 50 Vrms into I	ine Amp.; V _c =	F V gyaga Maria panga ataung anakadahan	on Tape	3 CDB
Line Amplifier Sett For Calibration (in a for	Data (To the first that	
Lab. Gain LG = //	Tape Monitor	Gain m	fo = Ga =	,
Displacement Pickup S = 035 in./Vol	Lt			
Equivalent of Calib $D_c = V_a \cdot S = 0$		us should the department of the property of	es E violational e e e estatue	energi salahan sisi si Sancian) se salahah 19 19 19 (1999)
Equivalent of Call	oration for PSI	Plots		
(TMG)(LG))2	\$10% X.11	, , ,		in. ² /cps
Analyzer Attenuator		Log Cor	verter S	etting db
Calibration Notted		y 4 400000	V100	in.2/cps
Overall Deflection	Level of Lata			
RMS Defl. Level =	$\frac{(D_c)(V_R)}{(IMG)(LG)(V_C)}$. · İŊ «



CALC BT WALK REVISED DATE POWER SPECTRAL DENSITY ANALYSIS

CHECK OF DISPLACEMENT PICKUP

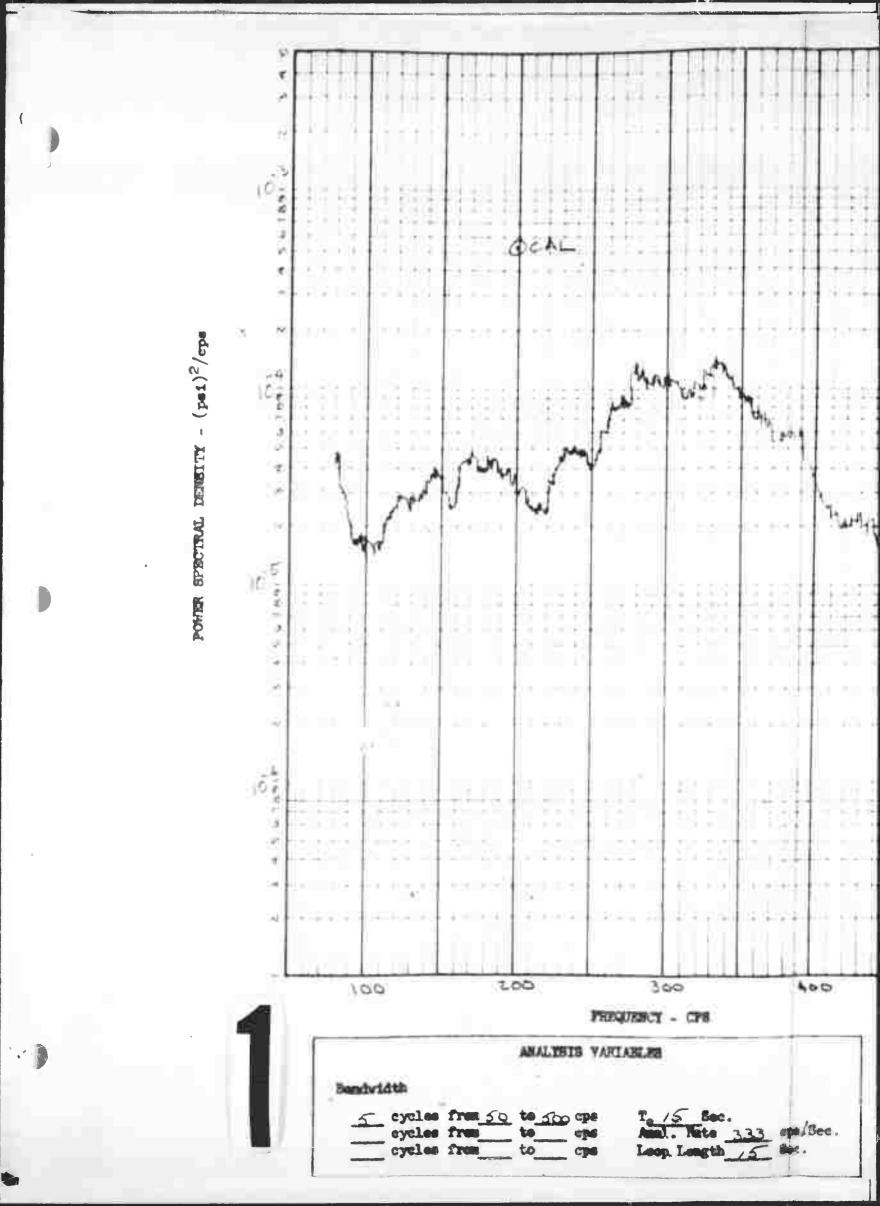
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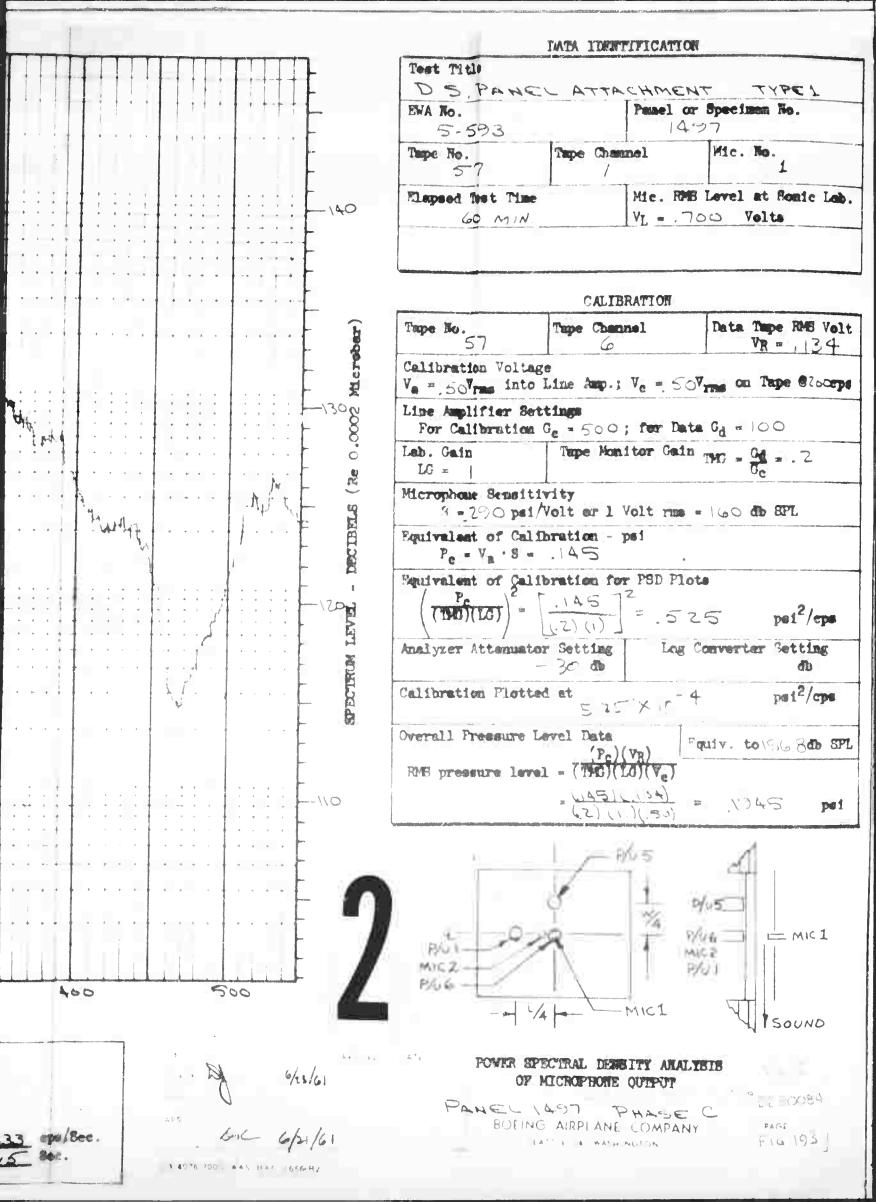
BOEING AIRPLANE COMPANY

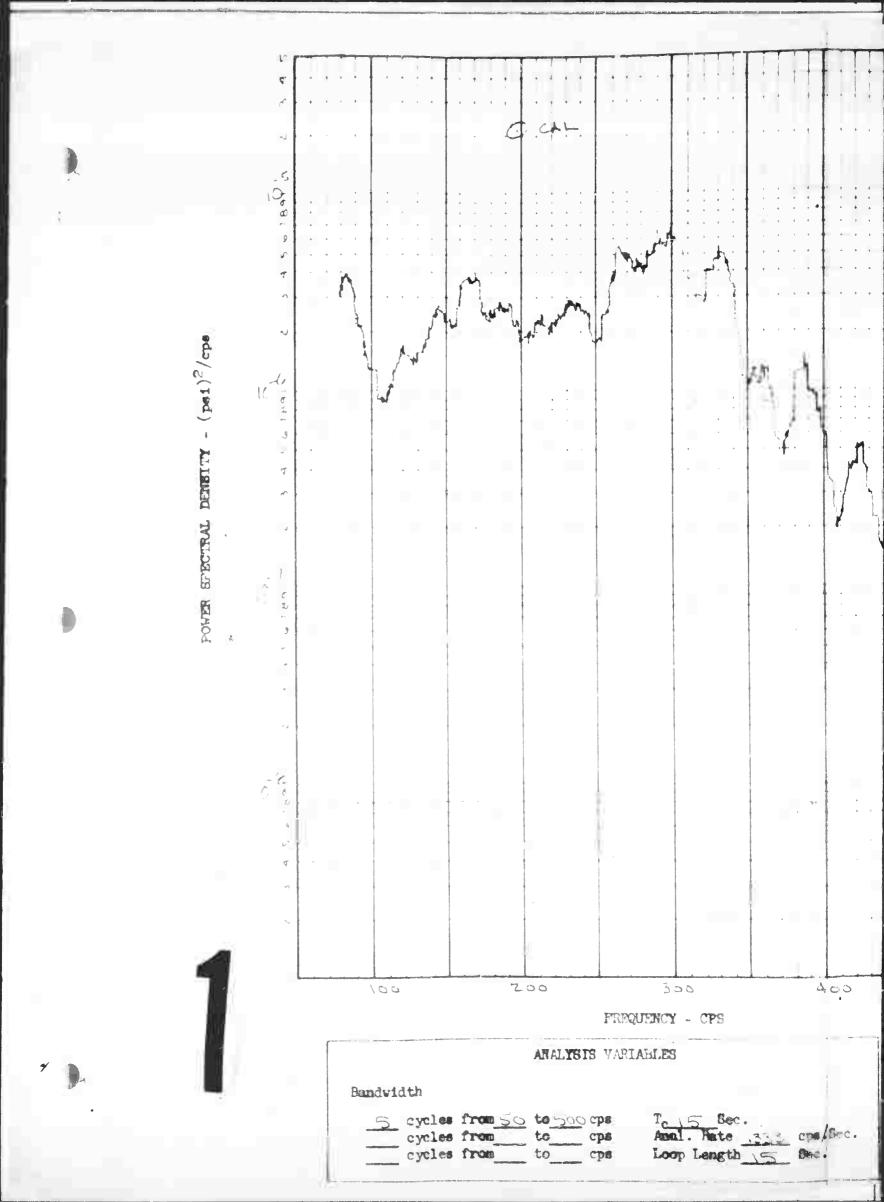
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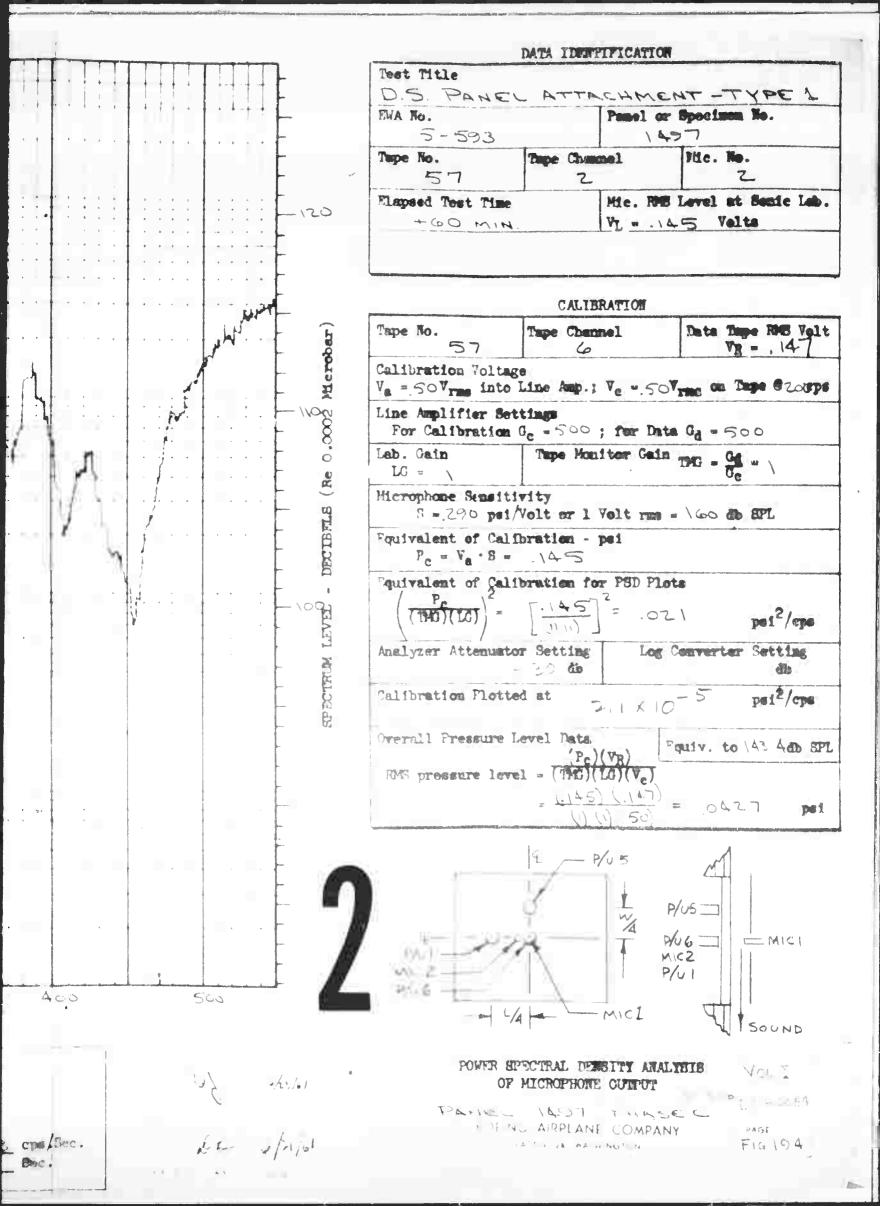
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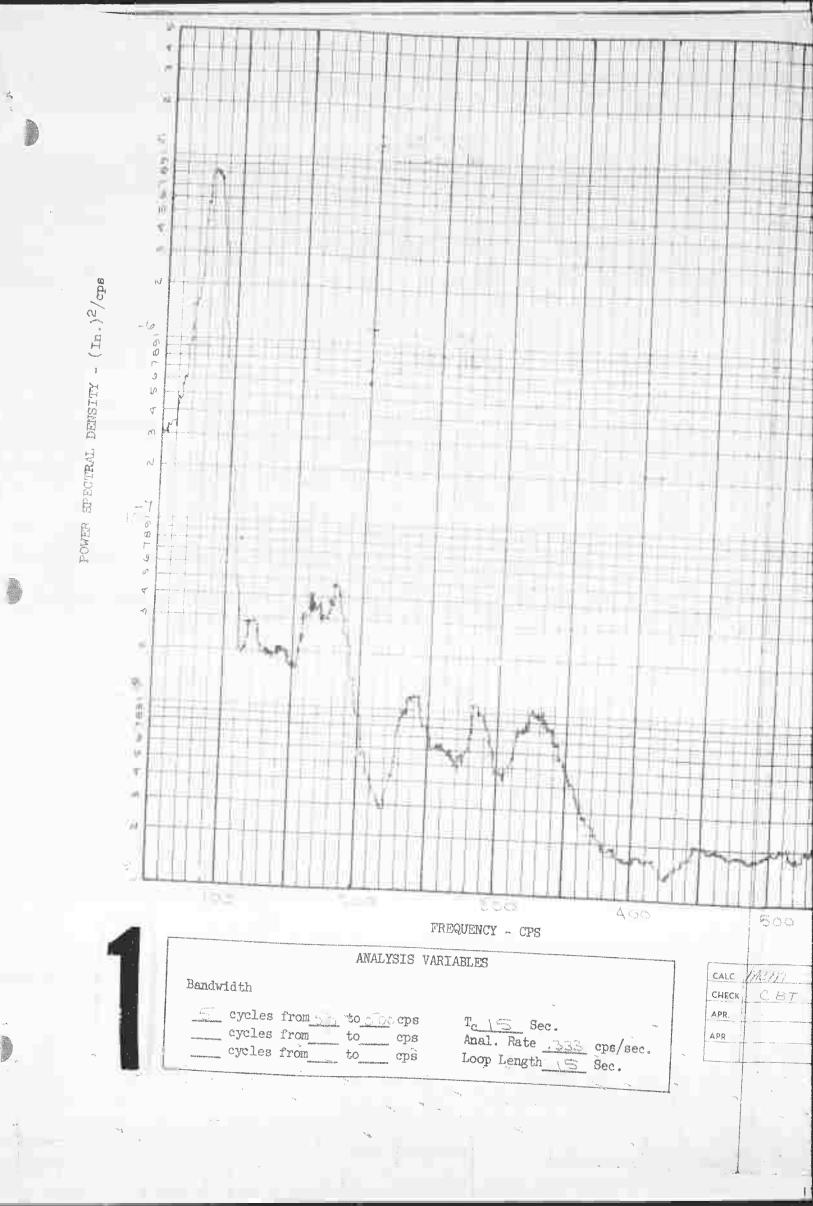
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DATA IDENTIFICATION							
Test Title							
D. E. PANEL ATTACHMENT - TYPE I							
EWA No.	a modele for promise and anticle descent agrees of the enterpolity for integrating and estimate account for the	Panel o	r Specimen	No.			
Committee and franchischer international franchischer international confidence in the confidence in th		\	457				
Tape No. Tape Char		nel	Displac	isplacement Pickup			
57		3		7			
Elapsed Test Time		P/U RMS Level at Sonic Lab.					
60 MIK.		VL = .7	165 Volt	ts			
		n programme after the control of the	Touris water auch major organism y yan yezh de Perez de hañ de e Perez de e Pe	gopune undiringés bang dangaransu api taip is anija anija ating dang dalah labahalik da 1994-1988 s			

CALIBRATION

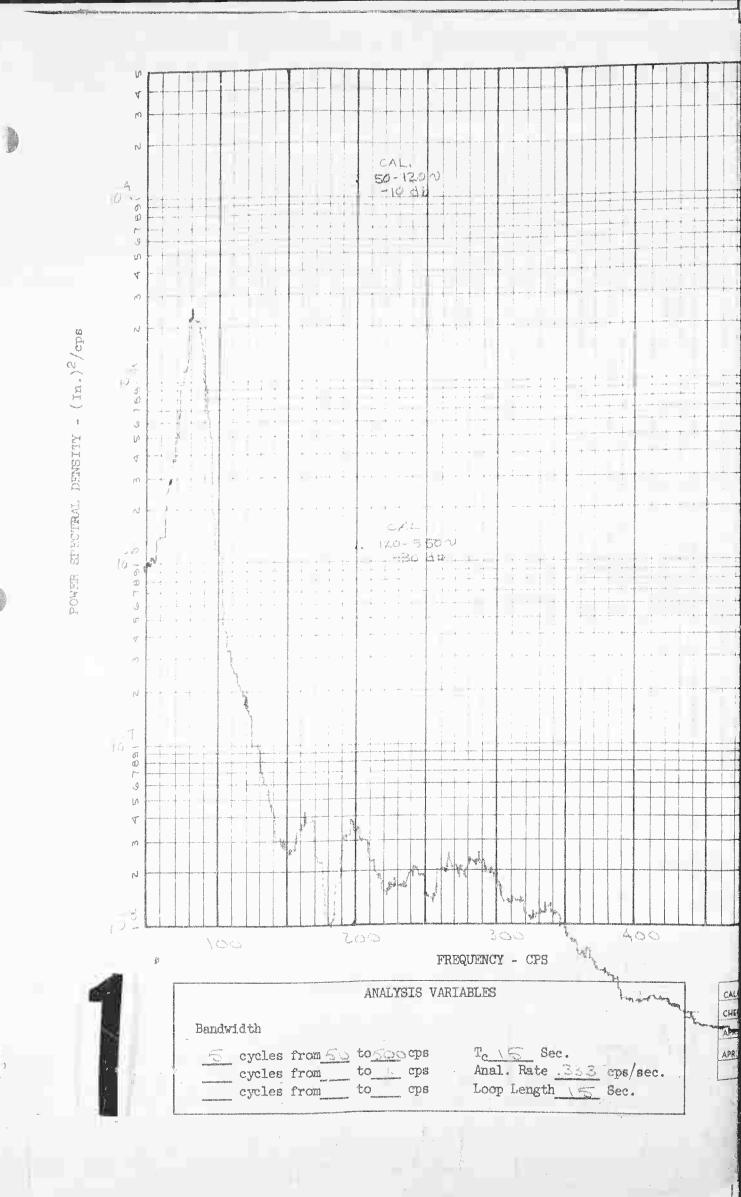
Tape No.	Tape Channel	Data Tape	RMS Volt
57	6	V _R =	
Calibration Voltage		ille agrama and the stageth was the effect of the computer closs or it.	cc > 1 magallagit maga
Va = 50Vrms into 1	Line Amp.; $V_c = .50^{\circ}$	rms on Tape	e 6200 cps
Line Amplifier Sett For Calibration (L = Soo : for Data	Gd = 100 (100)	-76 - 3
Lab. Gain	Tape Monitor Gain	ren Ga	AND COLUMN TO THE STATE OF THE
	Tape Monitor Gain	Ge Ge	* 5
Displacement Pickup 8 = 0354in./Vol	Sensitivity		The state of the s
Equivalent of Calib $P_c = V_a \cdot S =$		T T PART - AAS IN	
	ration for PSD Plots		Saminfel C. Westerman School Control of the Control
$\left(\frac{D_{c}}{(TMG)(LG)}\right)^{2}$	0/77. * 5/2/ = N.T. E	per from the	tn.2/cps
white the transfer of the tran	Setting Log Co db by No.		tting (db
Calibration Plotted	at. 15 ()/.	and the first	. 0/
Overall Deflection	Level of Data	The second section of the second sections of the section sections of the second sections of the section sections of the second section section sections of the section section section sections of the section section section sections of the section se	in.2/cps
RMS Defl. Level = .	(D _C)(V _R) (TMG)(LG)(V _C)). v	. I T In.
63	A STATE OF THE PERSON NAMED OF THE PERSON NAME		an enamed spaint gerriterie falls service of

CALC MATTING REVISED DATE POWER SPECTRAL DENSITY ANALYSIS

CHECK C.B.T. 6/2/6 OF DISPLACEMENT PICKUP

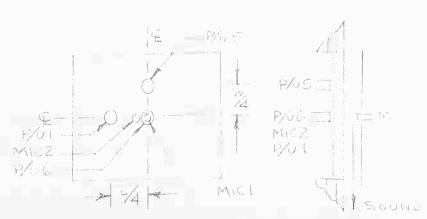
APR. BOEING AIRPLANE COMPANY

SEATTLE 24, WASHINGTON FIG. 195

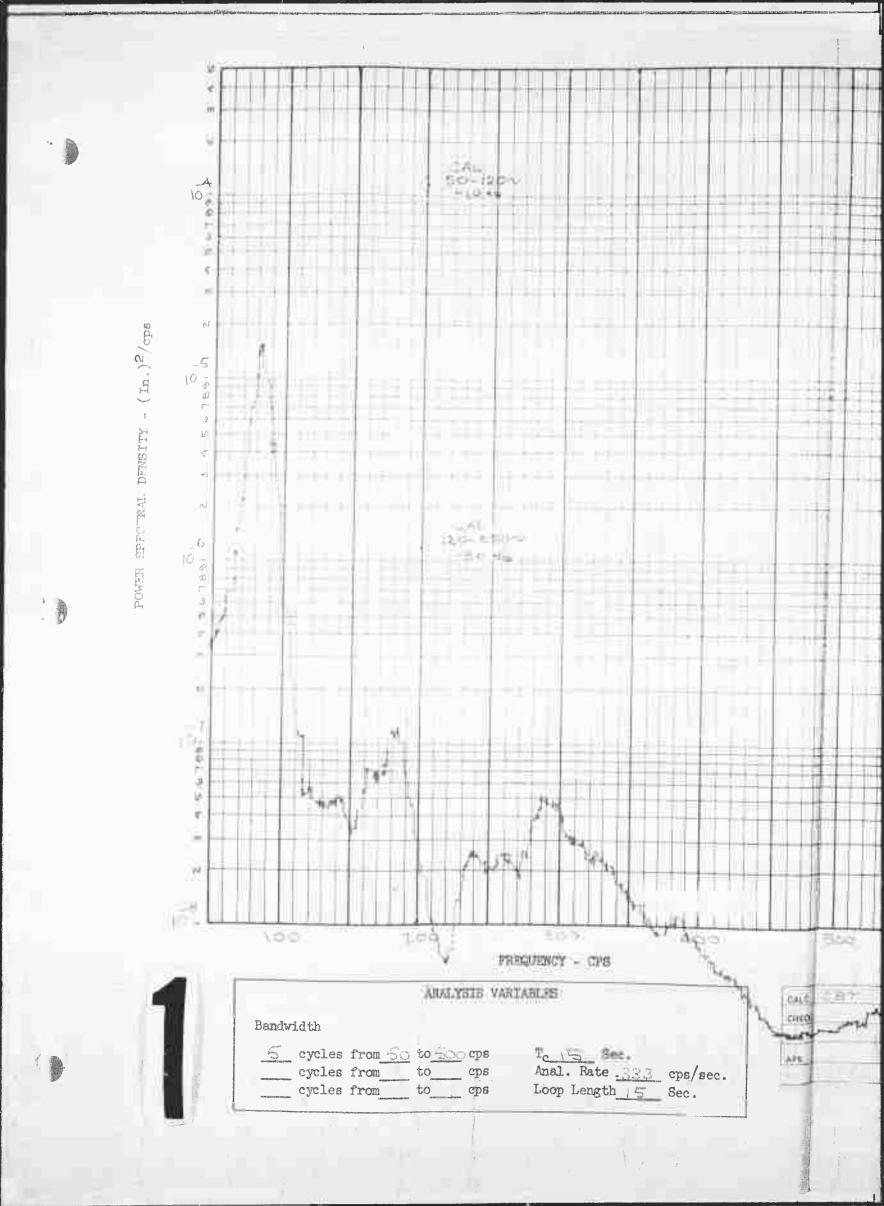


	DATA IDENT	HEFICATION		
Test litle D.S. FANCL			Make The Thirty	
EWA No. Panel or Specimen No.				
Tape No.	Tape Chanr	161	Displacement Pickup	
Elapsed Test Time	To the state of th		evel at Sonic Lab.	
Agentification (Auto-Cardinal Septimental Auto-Cardinal Septimental Septimenta				

Tape No.	Tape Channel	Data Tape RMS Volt $V_R = 7.90$						
Calibration Voltage	entraggementerial algebrasischen und von seiner Steiner V (1) in der eine Auflicht der eine Steine der eine Steine der eine Steine der eine Steine St	V _{rms} on Tape @2.00cp						
Line Amplifier Settings For Calibration $G_c = 5000$; for Data $G_d = 2000$								
Lab. Gain LG = \	Tupe Monitor Gain	TMG = Gd =						
	Displacement Pickup Sensitivity S = 3:5 4in./Volt							
*	Equivalent of Calibration - in. $D_{c} = V_{8} \cdot S = 0.77$							
Equivalent of Callb	ration for PSD Plo	to						
$\left(\frac{D_{C}}{(\text{TMG})(\text{LG})}\right)^{2} = \frac{1}{12}$	(1777) = 1.7	5 in.2/cp						
Analyzer Attenuator								
Calibration Plotted	at 103X10 4	/17. =0 / 17. =0 / 17. = 1, 17. in. 2/cp						
Overall Deflection	Level of Data							
RMS Def]. Level = .	$\frac{(\mathrm{D}_{\mathrm{c}})(\mathrm{V}_{\mathrm{R}})}{(\mathrm{IMG})(\mathrm{LG})(\mathrm{V}_{\mathrm{c}})} = \frac{1}{7.5}$	in.						



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CALC PRT 6/29/5 REVISED DATE POWER SPECTRAL DENSITY ANALYSI	s Vocti
CHECK OF DISPLACEMENT PICKUP	
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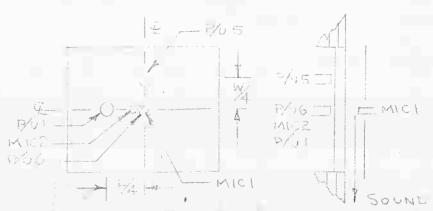


DATA IDENTIFICATION

Test Title D.S. PANG	as have been the second	2 MHDA	Make a who he	Services of the services of th		
EWA No. Panel or Specimen No.						
Tape No.	Tape Chan	nel	Displacement	Pickup;		
Elapsed Test Time	1 '	evel at Sonic	Lab.			
anger of defended a defended to 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,						

CALIBRATION

таре No.	Tape Channel	Data Tape RMS Volt					
Calibration Voltage	e Line Amp.; V _c = 50	rms on Tape @ეეсря					
For Colthrotton (Line Amplifier Settings For Calibration $G_c = 0.05$; for Data $G_d = 2.50$						
Lab. Gain LG =	Tape Monitor Gain	TMC = Gd = F					
Displacement Pickup S = 03 % 4in./Vol							
Equivalent of Calif							
Equivalent of Calil	oration for PSD Plot	Ü8					
$\left(\frac{D}{\text{TMG}}\right)(LG)^2$	1.25	7/0 ³ in. ² /eps					
Analyzer Attenuato:	r Setting Log (Converter Setting db					
Calibration Plotter		10 0 CO 126 00					
125 () 1 2 1 2 1 1 2 cps							
Overall Deflection							
RMS Defl. Level =	$\frac{(D_c)(V_R)}{(TMG)(LG)(V_c)} = \frac{1}{15}$	(17 (23 - 2.0163 in.					

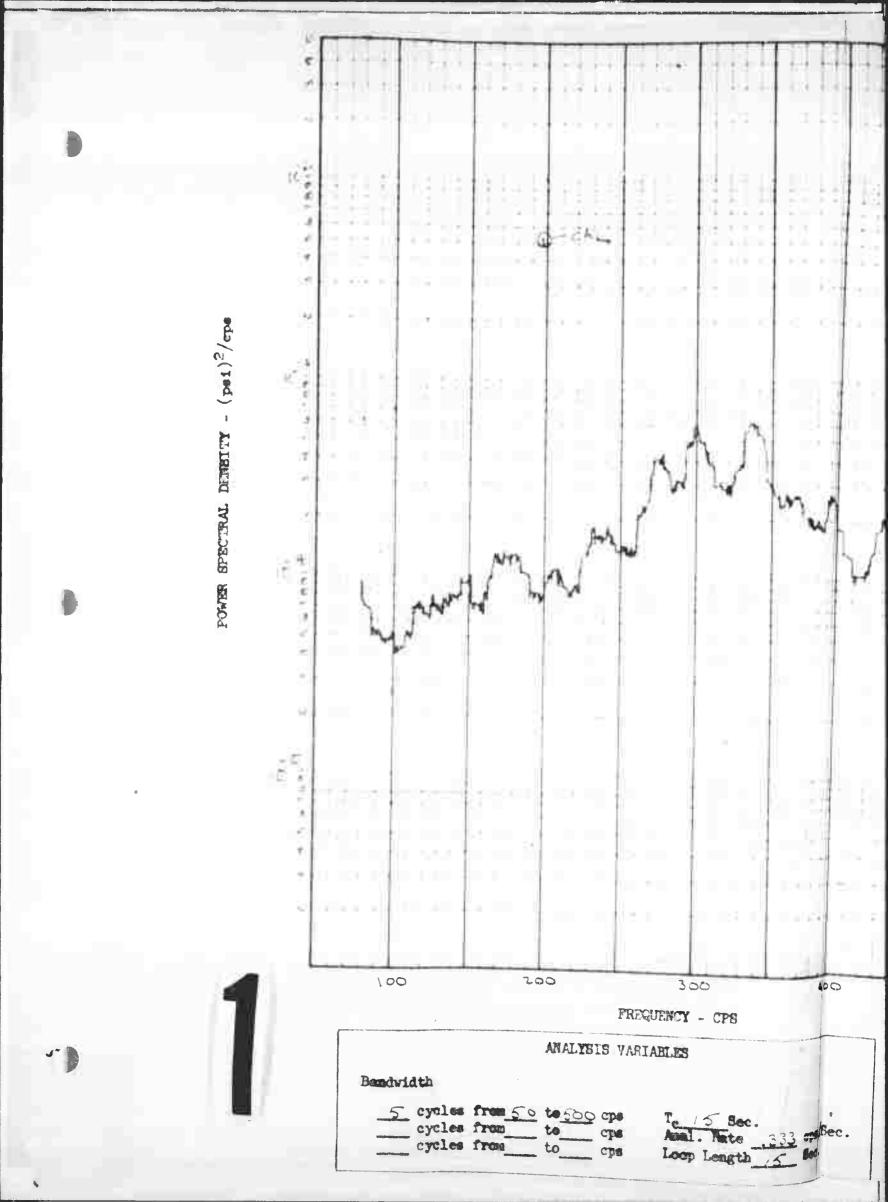


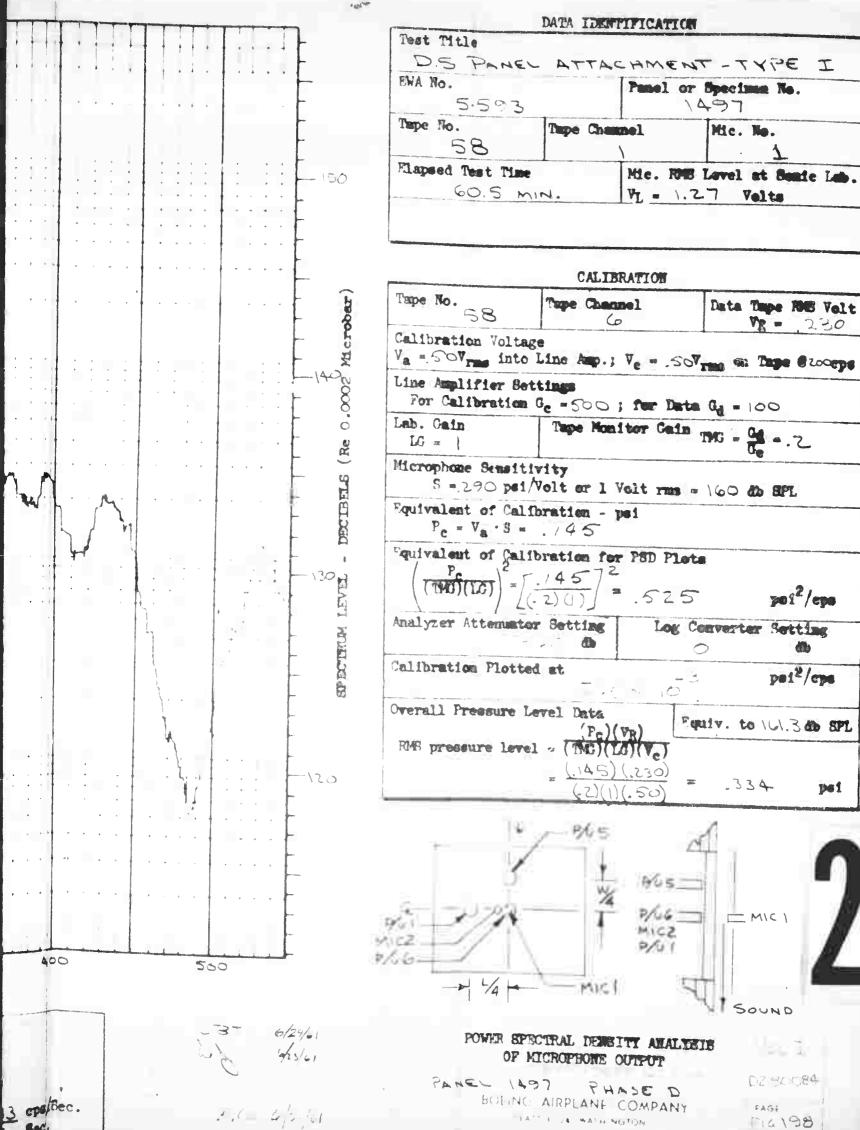
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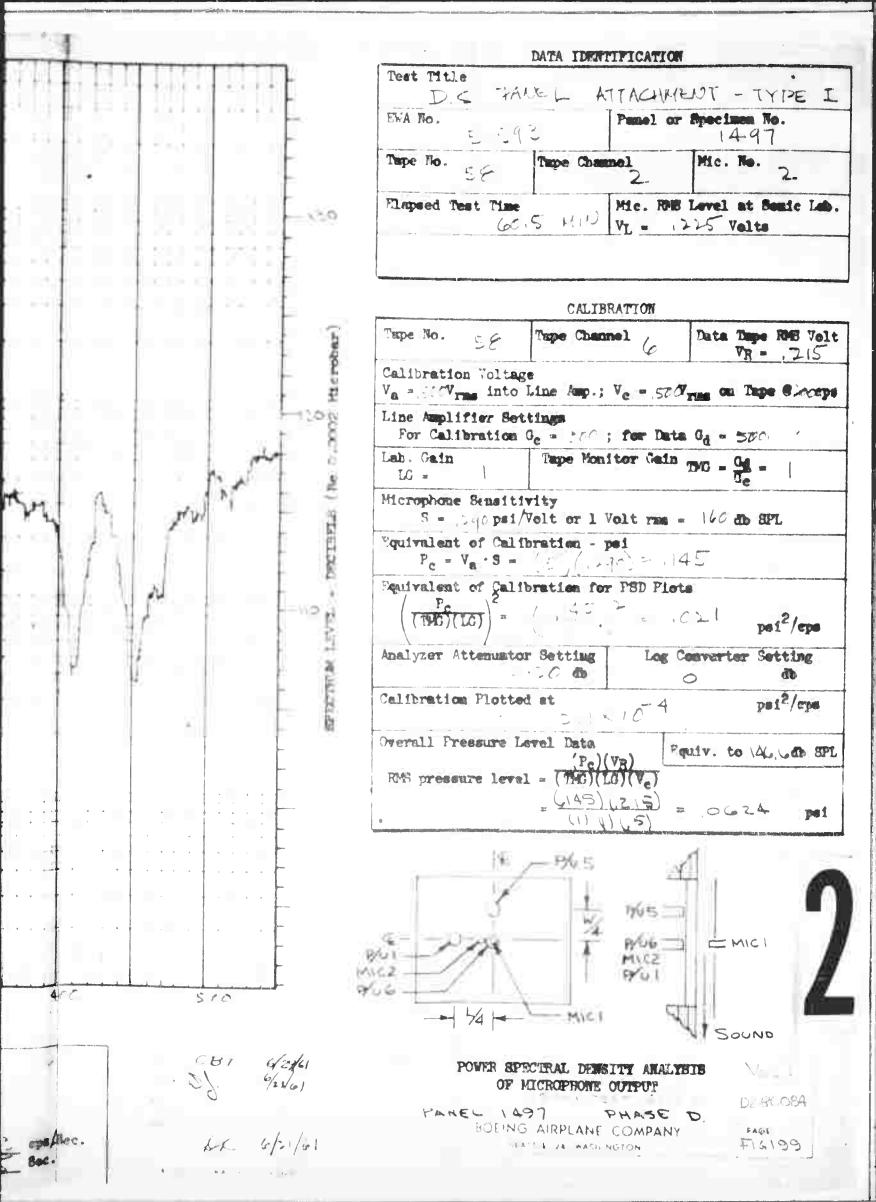
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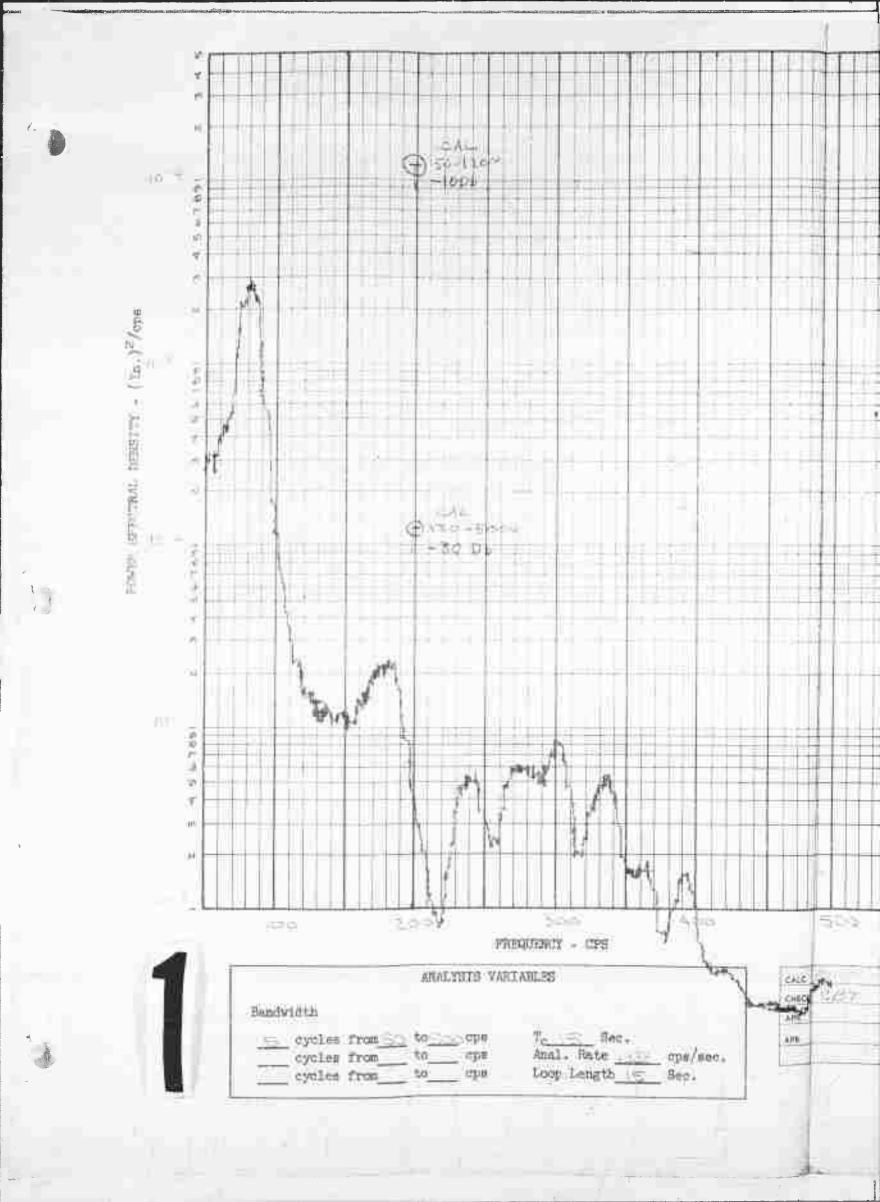
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POWER SPECTRAL DEMOTITY - (pet)2/cps 100 460 PROQUENCY - CPS ANALYSIS VARIABLES Bendvidth te 500 cps cycles from cycles from





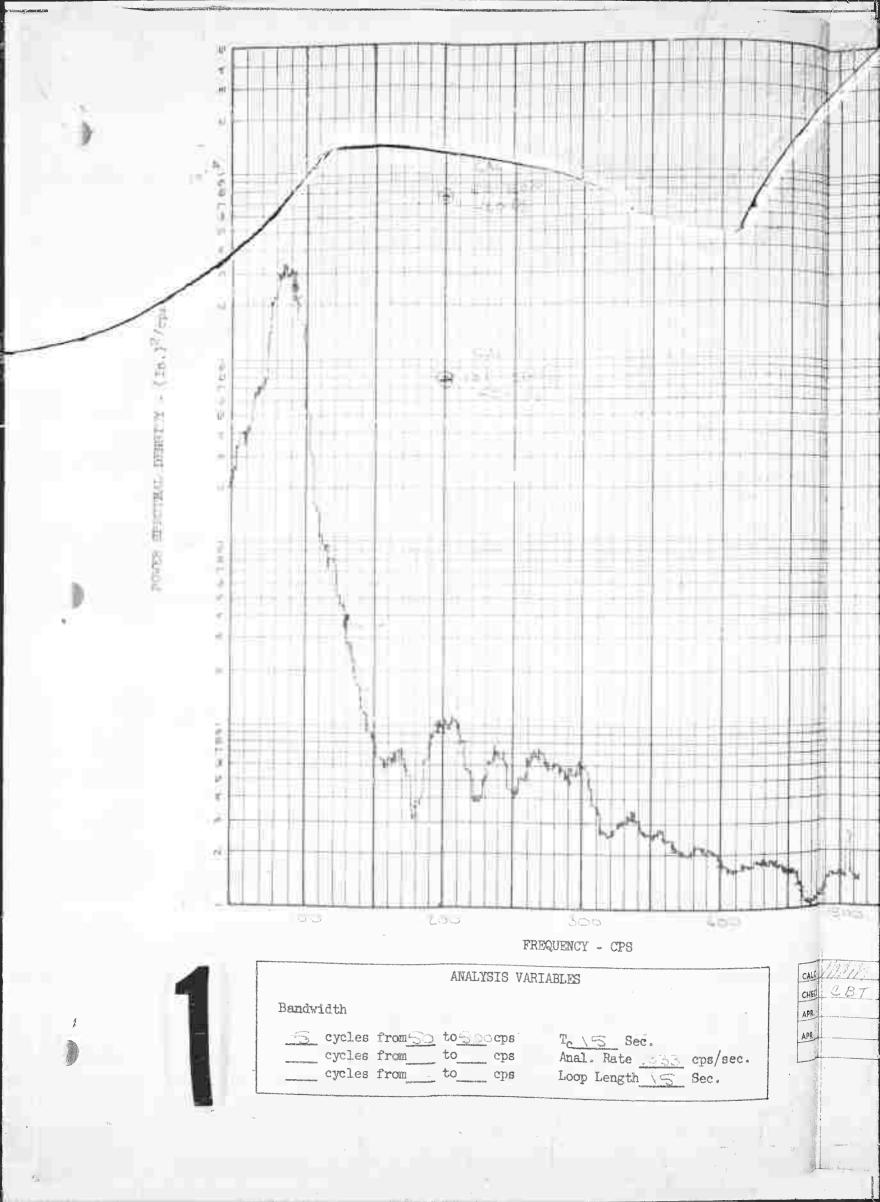
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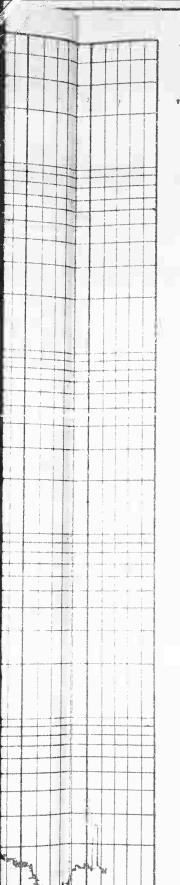
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D & DANE	The second secon		and the second s	MARKET.
EWA No. 5-593			Specimen 437	No.
Tape No.	Tape Chann	iel	Displac	ement Pickup
Elapsed Test Time	** ,***		Level at Volt	Sonic Lab.

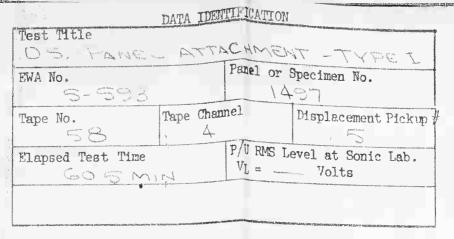
Tape No.	Tape Channel	Data Tape RMS Volt
Calibration Voltage		rms on Tape @ Zobops
Line Amplifier Set For Calibration (Ge = 100; for Data	
Lab. Gain LG = \	Tape Monitor Gain	IMG = Ga = 5
Displacement Pickup S = 0.45 4n./Vo.		
Equivalent of Calif		
Equivalent of Cali	bration for PSD Plot	The control of the depth of the confidence of the control of the c
$\left(\frac{D_{c}}{(\text{TMG})(\text{LG})}\right)^{2}$	017711	in.2/cps
Analyzer Attenuato	r Setting Log C	onverter Setting ab
Calibration Plotte	d at 1/26 (1)	in.2/cps
Overall Deflection		and the second s
RMS Defil. Level =	(D _C)(V _R) (O) (TMO)(LG)(V _C) (O) (O) (D) (D) (D) (D) (D) (D) (D) (D) (D) (D	



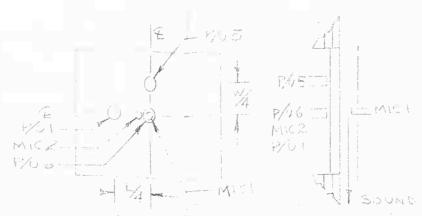
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APR BOEING AIRPLANE COMPA	NY PAGE
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Tape No.	Tape Channel	Data Tape	
Calibration Voltage		rms on Tape	e @_mocps
Line Amplifier Settler For Calibration (1 - 200 Por Dote	100	Andrews and the state of the st
Lab. Gain LG = \	Tape Monitor Gain	TMG = Gd =	A
Displacement Pickur S = 03 54in./Vol	Sensitivity	7.57	of an American Control State of the Control Co
Equivalent of Calib		٠ (,	
Equivalent of Calif $\left(\frac{D_C}{(TMG)(LG)}\right)^2 = \frac{1}{C}$			in.2/cps
Analyzer Attenuator	r Setting Log (Converter S	etting db
Calibration Plutted	1,32 (10°5)		
Overall Deflection	Level of Data	- Salajanja erralgir ir pra katematuruji ka pamaja erra erra erra erra erra erra erra e	
RMS Defl. Level =	$\frac{(D_c)(V_R)}{(TMG)(LG)(V_c)} =$	77	S 111.
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1 8 T 1 600/	POWER SPECTRAL DENSITY ANALYSIS
CHECK CHECK	OF DISPLACEMENT PICKUP
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APR.	BOEING AIRPLANE COMPANY
Age of the	AMPLANE COMPANY FIG 201
and the same of th	SEATTLE 24, WASHINGTON
	TOTAL

POWER SPECIMAL DENSITY - (In.)2/cps (130 100 FREQUENCY - CPS ANALYSIS VARIABLES CALC CHECK Bandwidth cycles from to cps T_{c} Sec. Anal. Rate 333 cps/sec. APR Loop Length 15 Sec.

TO DAY

Test Title

D.S. TAME ATTACHMENT TYPE T

EWA No.

Panel or Specimen No.

ASSTRATE Channel

Displacement Pickup #

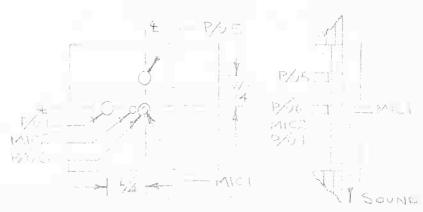
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Elapsed Test Time

P/U RMS Level at Sonic Lab.

VL = Volts

Tape No.	Tape Channel	Data Tape RMS Volt
Calibration Voltage	emperenciale en 19 (%), and allo (h) the released they depend reserved of these releases are simple count. Manual deputs according to	mis on Tape @ Socops
Line Amplifier Set	lings Puto	The state of the s
Lab. Gain LG = \	Tape Monitor Gain	TMG = Gd = 12
Displacement Pickup 6 = 0 1 4 in./Vol	Sensitivity	
Equivalent of Calif		der vermannen i tredeste er i spressere betremmen vermanne er generalen er vermannen der vermannen der verde s I
Equivalent of Calib	oration for PSD Plot	G
$\left(\frac{D_{c}}{(IMC)(LG)}\right)^{2} = \left(\frac{1}{2}\right)^{2}$	Control of the state of the sta	_ i. vo i in.2/eps
Analyzer Attenuator	Setting So-120 Co	onverter Setting
Calibration Flotted		
Overall Deflection	Level of Data	And the state of t
RMS Defl. Level =	$\frac{(D_c)(V_R)}{(TMG)(LG)(V_C)} = \frac{1}{\sqrt{2}}$	TO (1949) The Time
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CALC CHECK C TO T	REVISED DATE	POWER SPECTRAL DENSITY ANALYSIS OF DISPLACEMENT PICKUP	
APR		BOEING AIRPLANE COMPANY SEATTLE 24, WASHINGTON	PAGE FOR THE SERVICE

(1) 10 1887 3 Į0 SPECIRAL DENSITY - (ps1)²/cps 6 1881 6789 in 200 300 400 FREQUENCY - CPS ANALYSIS VARIABLES CALC CHECK SOA Bandwidth APR. S cycles from 50 to 500 cps To 4 Sec.

cycles from to cps Loop Length 4 Sec. APR.

DATA IDENTIFICATION

DANEL ATTACH	TYPE I PRELIM
EWA No. 5-593	Panel or Specimen No.
Tape No. Tape Char	nel Mic. No.
Elapsed Test Time +5	Mic. RMS Level at Sonic Lab.

CALIBRATION

\$25.6 26.55 km in part of the complete and the complete a	Contract to the Contract of th	THE RESIDENCE OF THE PROPERTY
Tape No.	Tape Channe	Data Tape RMS Volt VR = .196
Calibration Voltage $V_a = 5 V_{rms}$ into 1		V _c = 52V _{rms} on Tape @200cps
Line Amplifier Set- For Calibration ($J_{c} = .500;$	for Data Gd = , 250
Lab. Gain LG = 1, 0	Tape Moni	tor $Gain_{TMG} = \frac{Gd}{Ge} = \sqrt{2}$
Microphone Sensiting S = 1200 psi/		olt rms = 30 db SPL
Equivalent of Cali		si
Equivalent of Calif $\left(\frac{F_{c}}{(\text{TMG})(\text{LG})}\right)^{2} =$	oration for	PSD Plots SATURD psi ² /cps
Analyzer Attenuato	r Setting db	Log Converter Setting ab
Calibration Plotte	d at	- 01 (10) bars/cha
Overall Pressure L	(Pc)(
RMS pressure leve		$\frac{G(V_c)}{(5L)} =$ psi



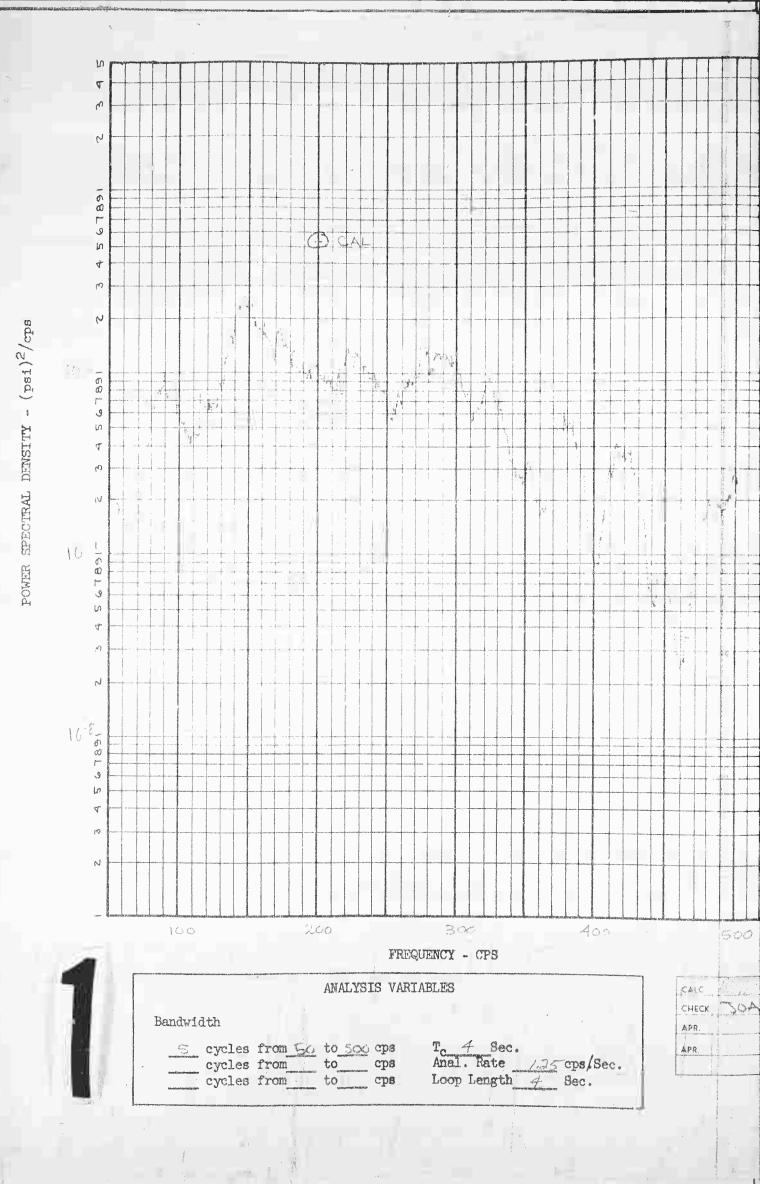
CALC CHECK SOA G	REVISED DATE	POWER SPECTRAL DENSITY ANALYSIS OF MICROPHONE OUTPUT	Vol. I.
APR		BOEING AIRPLANE COMPANY SEATTLE 24, WASHINGTON	PAGE FIG. 25.3

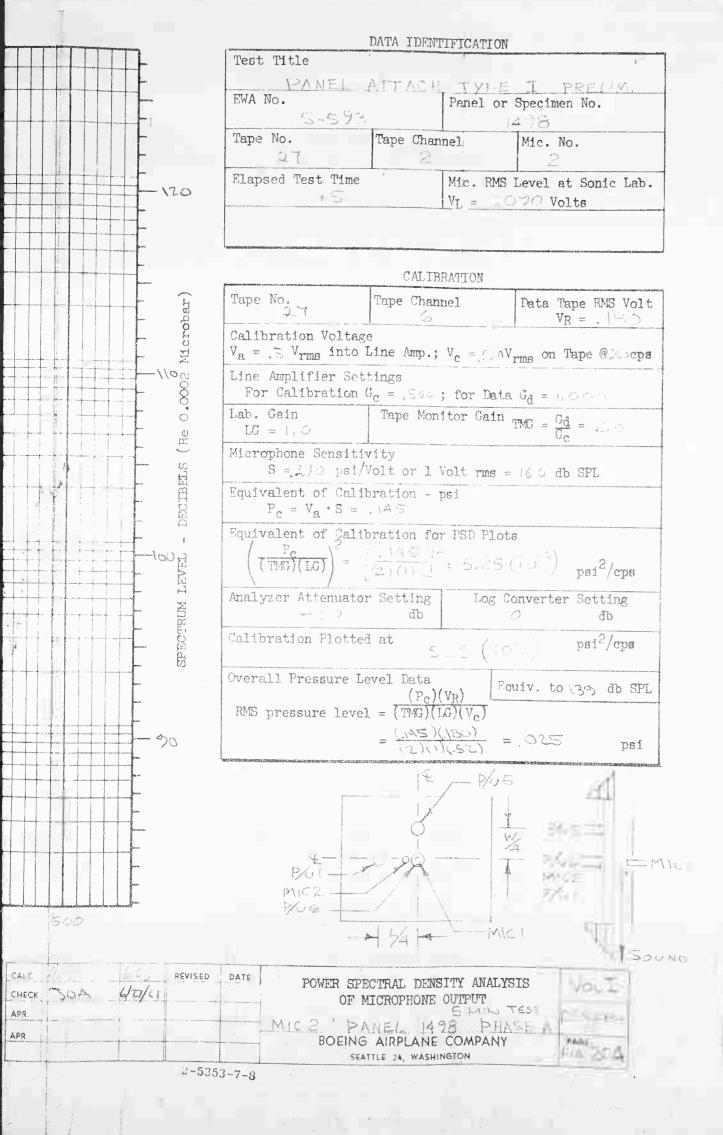
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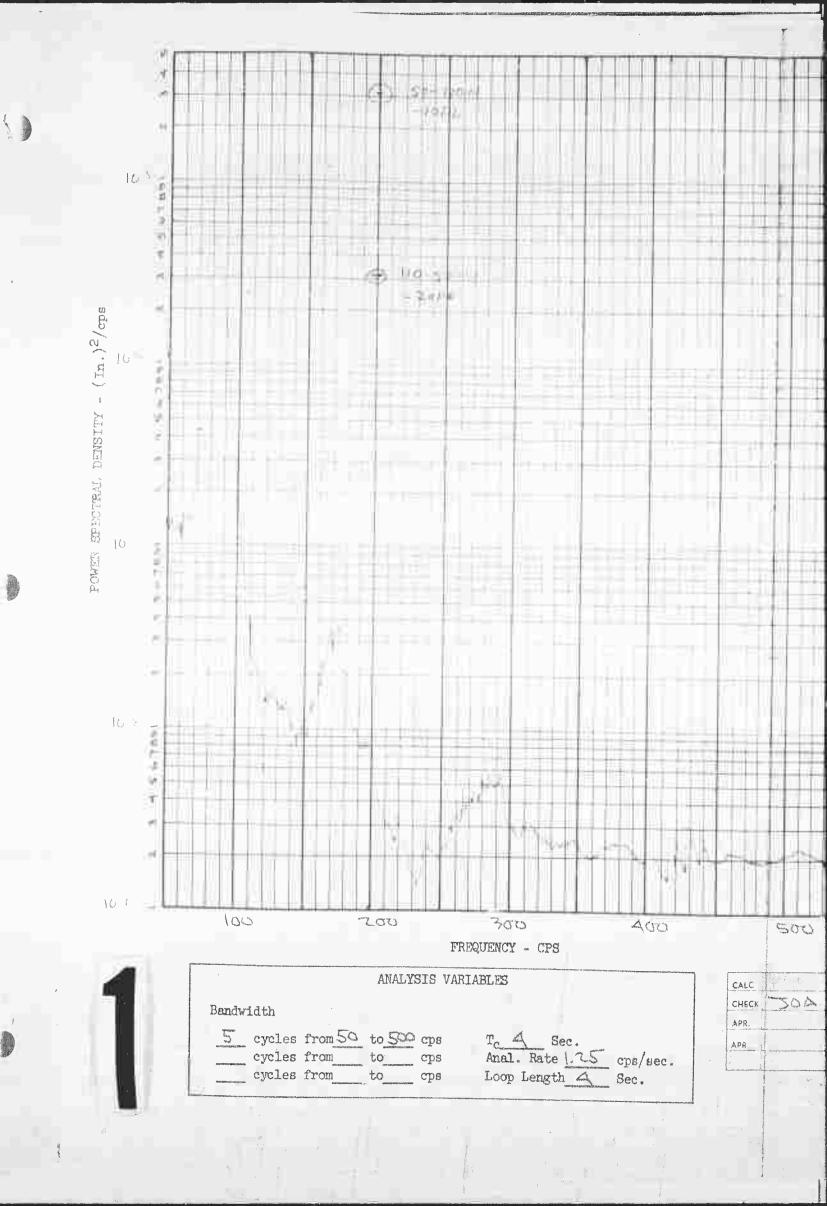
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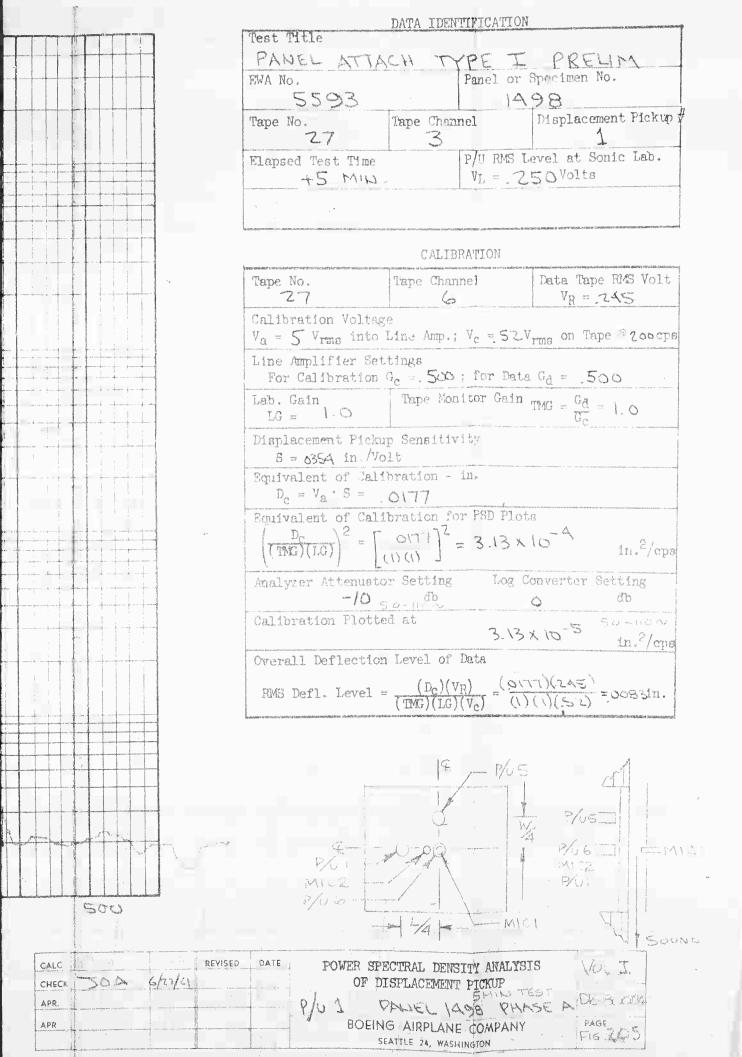
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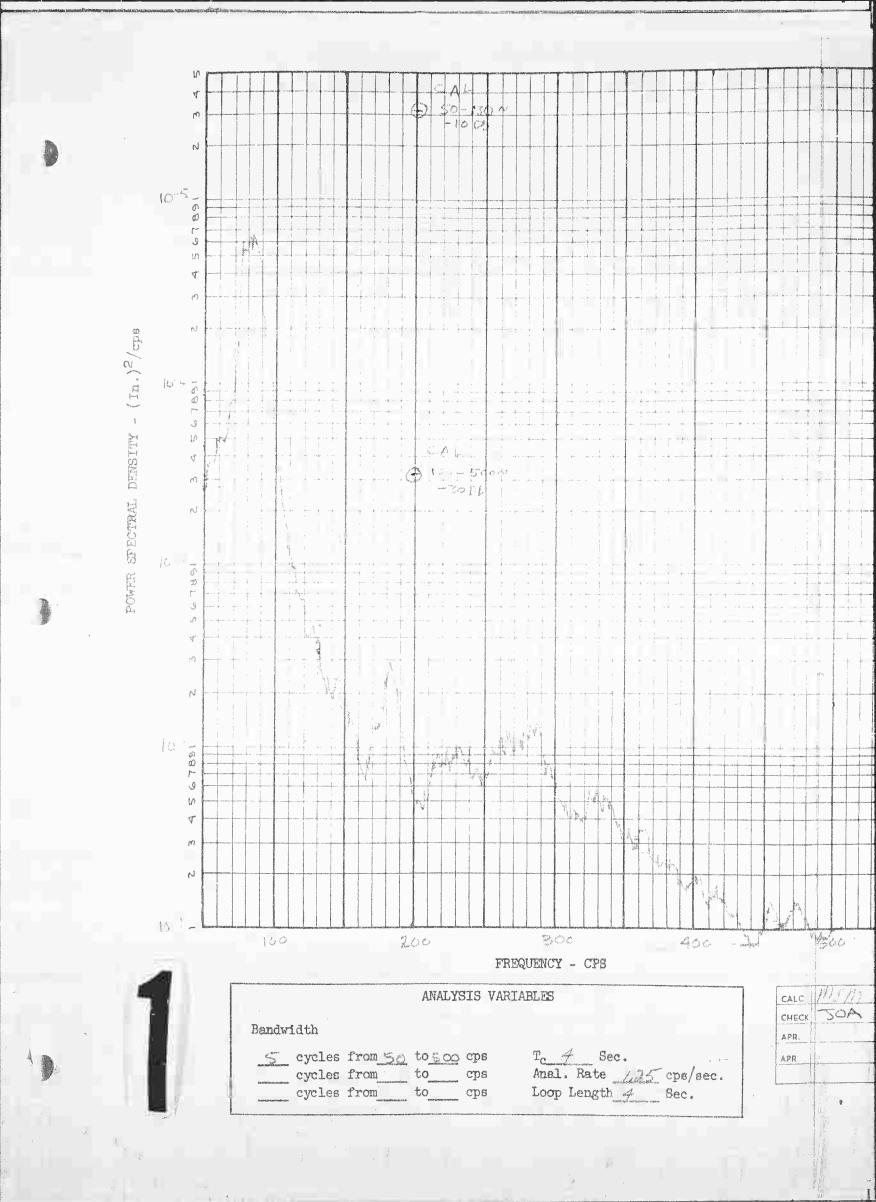
SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microbar)











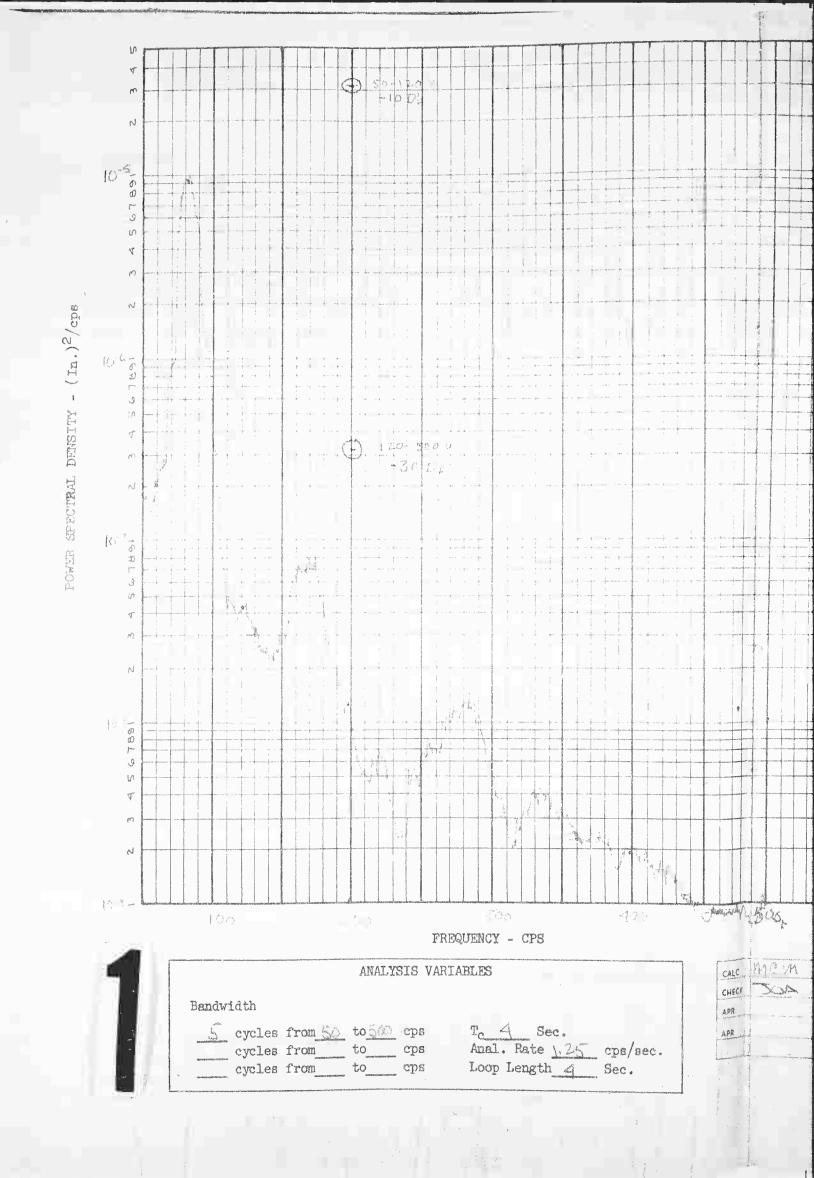
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DATA IDENTIFICATION Test Mtle o. | Panel or Specimen No. EWA No. 5-593 14-18
Tape Channel Channel 5 Tape No. P/U RMS Level at Sonic Lab. Elapsed Test Time VL = 320Volts

The state of the s	A marine intersectional of a restriction of the desirable of the contraction of the contr	per management earne grand north	ne pas esta con Transcriverer relativistica (con transcrivere fra	Commence of the Commence of th		
Tape No.	Tape Channel	D	ata Tupe			
St /	60		$V_R = \frac{1}{2}$	040		
	Calibration Voltage $V_{a} = .5 \ V_{rms} \ \text{into Line Amp.; } V_{c} = .52 \ V_{rms} \ \text{on Tape @200 cps}$					
	Tree this is . C	· ~ Lilli	g <i>v.</i>	· · · · · · · · · · · · · · · · · · ·		
Line Amplifier Set	$G_{\rm c} = .500$: for					
Lab. Gain $LG = \{ : \mathcal{Q} \}$	Tape Monitor	Gain TM	3 = ^C d = U _C	i C		
Displacement Pickup S = ,0354 in./Vol	*			The control of the co		
Equivalent of Calif $D_c = V_a \cdot S = C$				erromanda, il (din ils quasioni)		
Equivalent of Calli	oration for PSD	Plots	е и фресто литиност — познай естипност с с то с также е под пред с с с с с с с с с с с с с с с с с с с	mindridende i Samminder (1900 dem neueron euro), inder métos co suida en mindrio col (1) 		
$\left(\frac{D_{C}(LG)}{TRC(LG)}\right)^{2} = \left(\frac{1}{2}\right)^{2}$				in.2/cps		
Analyzer Attenuator	· Setting	Los con	mutan An	tting		
-10	db		<u>(</u>)	2		
Calibration Plotted	and an in-presentative seeding and how requires when the second and the second					
Cartoration Fiotosc		1.15 7		in.2/cps		
Overall Deflection Level of Data						
RMS Defl. Level =	$(D_{C})(V_{R})$ $(TMG)(LG)(V_{C})$		The second secon	011,122.		



CALC MACA REVISED DATE	POWER SPECTRAL DENSITY ANALYSIS OF DISPLACEMENT PICKUP	
APR.	B/US_ PANEL 1498_ PHISEA.	TX SY YPA
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2-5353-7-9		off Selebah (b) (Selebah (b) (S



DATA IDENTIFICATION Test Title FANGL Panel or Specimen No. EWA No. of Chin Tape Channel Displacement Pickup Tape No. 27 P/U RMS Level at Sonic Lab. Elapsed Test Time VL = 360 Volta CALIBRATION Tape Channel Data Tape RMS Volt Tape No.

VR = .355

Calibration Voltage

 $V_a = 10^{\circ} V_{rms}$ into Line Amp.; $V_c = SlV_{rms}$ on Tape @ 700 cps

Line Amplifier Settings

For Calibration $G_c = .500$; for Data $G_d = .500$

Lab. Gain LG = 1.0 Tape Monitor Gain TMG = Gd = 1.0

Displacement Pickup Sensitivity

8 = 0354 in./Volt

Equivalent of Calibration - in.

Do = Va · S = Col /

Equivalent of Calibration for PSD Plots

= 3.13(10") in.2/cos

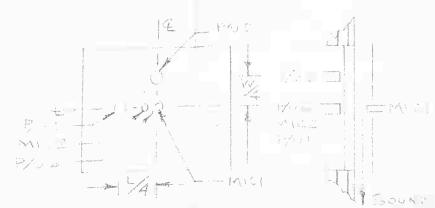
Analyzer Attenuator Setting Log Converter Setting -- 10 db

Calibration Flotted at

3.13 (10 in.2/cps

Overall Deflection Level of Data

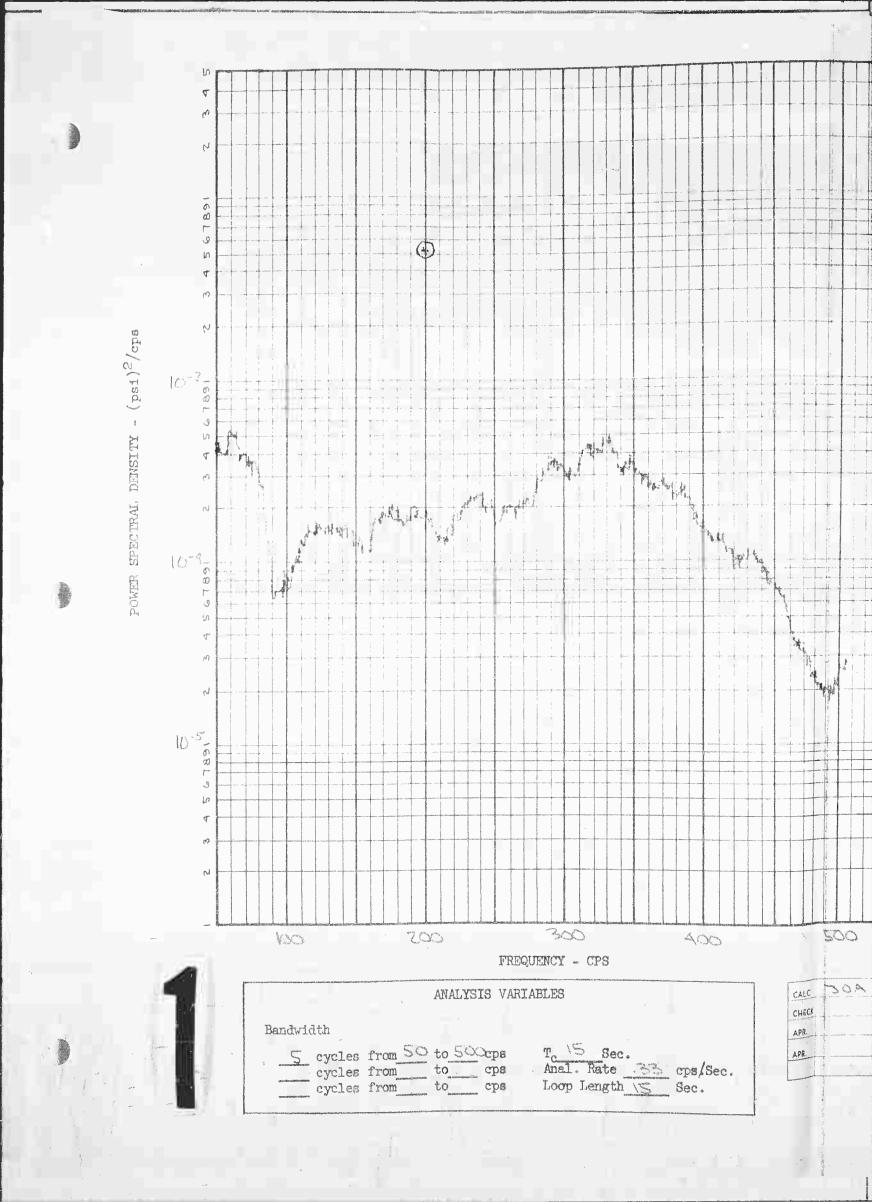
RMS Defl. Level = $\frac{(D_c)(V_R)}{(TMG)(LG)(V_c)} = \frac{(OVT)(3-5)}{(V_c)(V_c)} = O(2\sqrt{in})$.

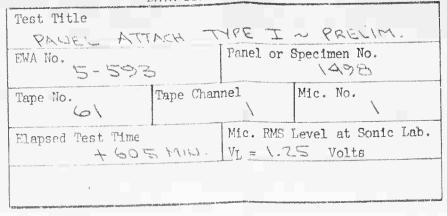


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	0100222101-1-11				
Tape No.	Tape Channel	Data Tape RMS Volt VR = .275			
Calibration Voltag	e Line Amp.; V _c = 48V	rms on Tape @ loops			
Line Amplifier Set For Calibration	$G_n = .500$; for Date	col. = 50 s			
Lab. Gain IG = \ O	Tape Monitor Gain	$TMG = \frac{Gd}{Gc} = .7$			
Microphone Sensiti	vity Volt or 1 Volt rms	- VSO db SPL			
Fquivalent of Cali Tc = Va · S =	bration - psi				
(TIMO)(LG)) = (Equivalent of Cal Coration for PSD Plots $ \left(\frac{P_c}{(7MG)(LG)}\right)^2 = \left(\frac{AS}{AS}\right)^2 = \frac{5.2 \times 10^{-6} \text{ psi}^2/\text{cps}}{5.2 \times 10^{-6} \text{ psi}^2/\text{cps}} $				
Analyzer Attenuator Setting db Converter Setting db					
Calibration Plotte	ed at	OES) psi2/cps			
Overall Pressure Level Data (Pc)(VR) Fquiv. to \(\s\) 5 db SPL					
RMS pressure leve	$el = (\underline{TMG})(\underline{LG})(\underline{V_C})$	= 340 psi			

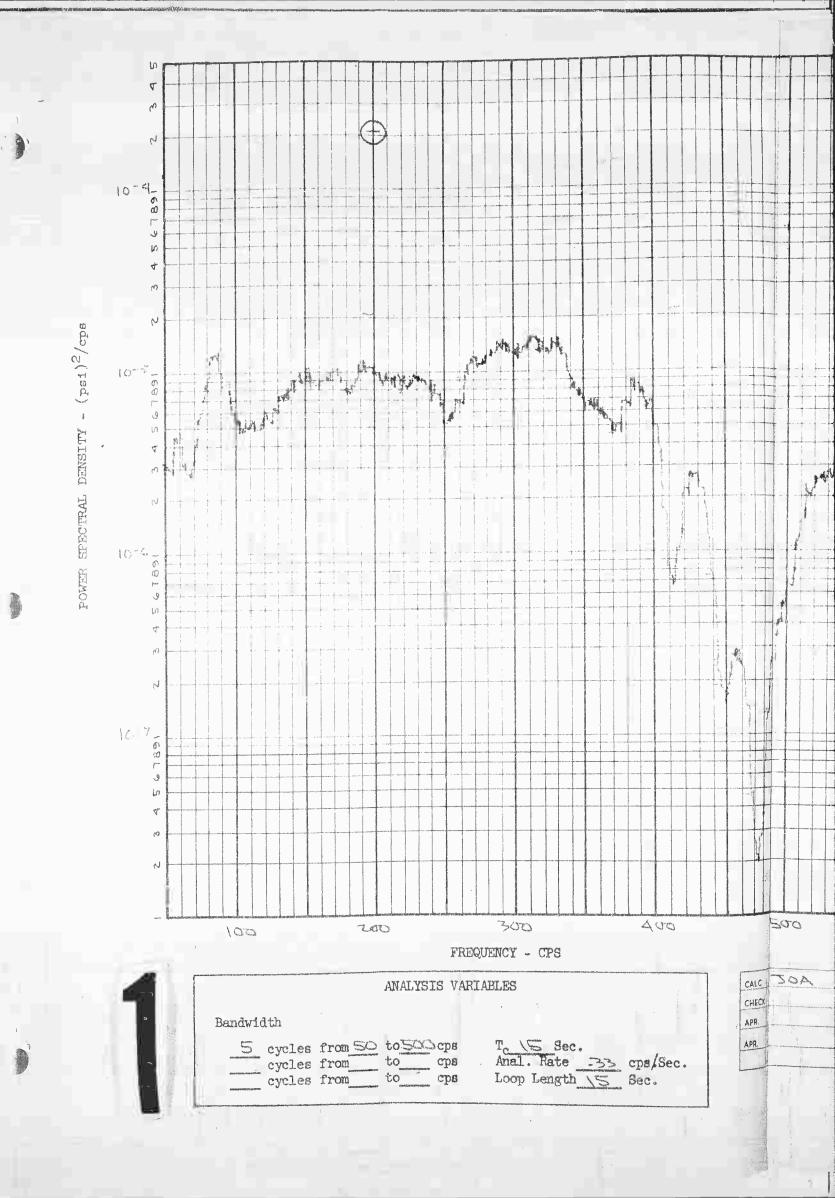


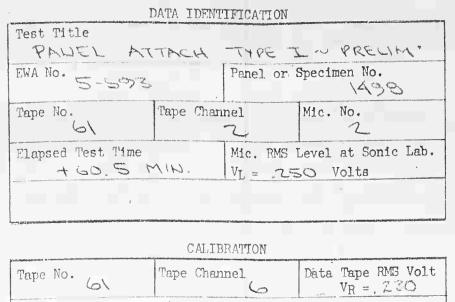
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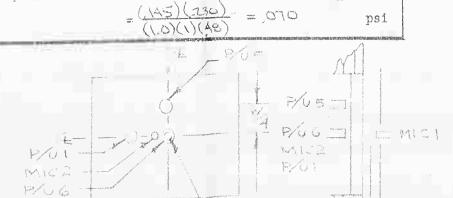
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SPECTRUM LEVEL - DECIBELS (Re 0.0002 Microber)





Calibration Voltage $V_a = .5 V_{rms}$ into Line Amp.; $V_c = 48 V_{rms}$ on Tape @ 700ceps Line Amplifier Settings Mor Calibration Gc = 500; for Data Gd = 500 Tape Monitor Gain TMG = $\frac{Gd}{Gc}$ = \-\circ\ I.C = Microphone Sensitivity S = 790 psi/Volt or 1 Volt rms = 160 db SPL Equivalent of Calibration - psi Pc = Va · S = WS Equivalent of Calibration for PSD Plots Log Converter Setting Analyzer Attenuator Setting psi2/cps Calibration Plotted at Overall Pressure Level Data Fquiv. to \An Gdb SPL (Pc)(VR) RMS pressure level = $(TMG)(LG)(V_C)$



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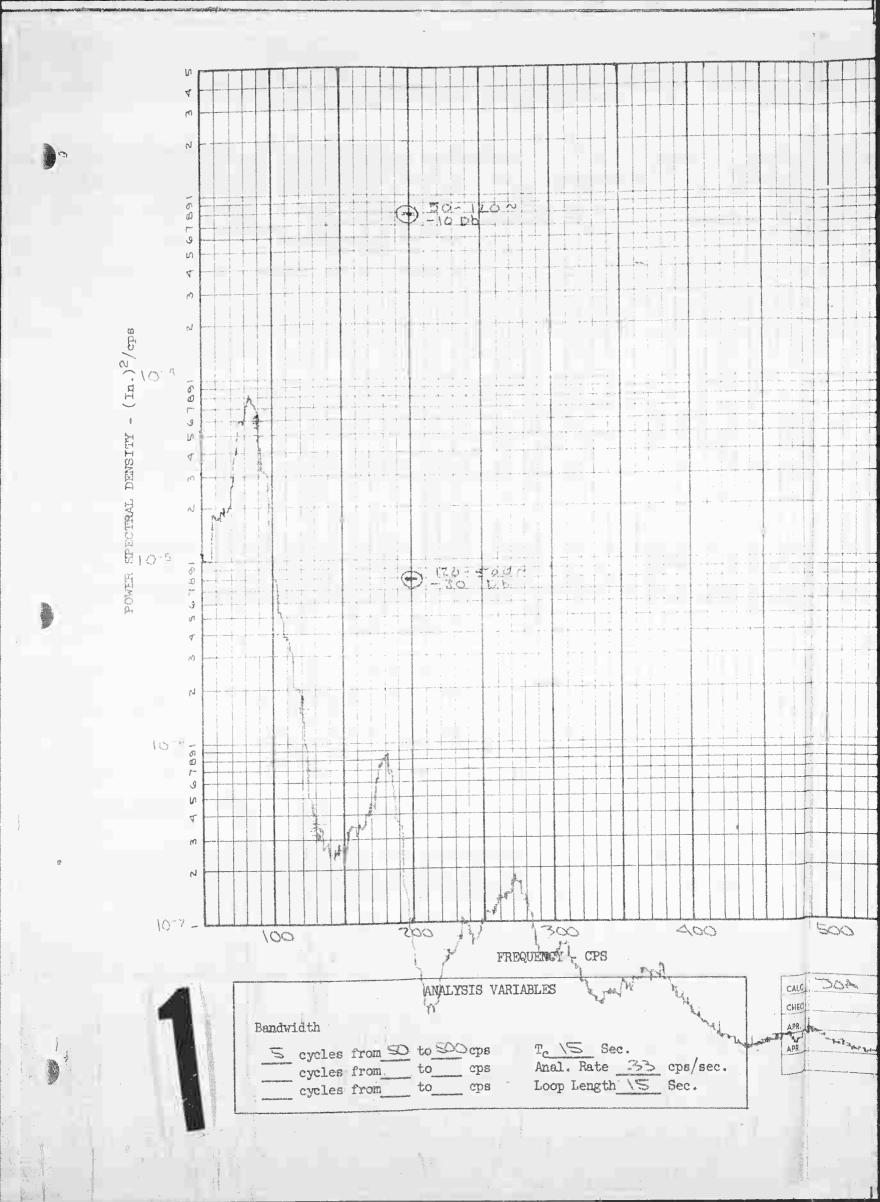
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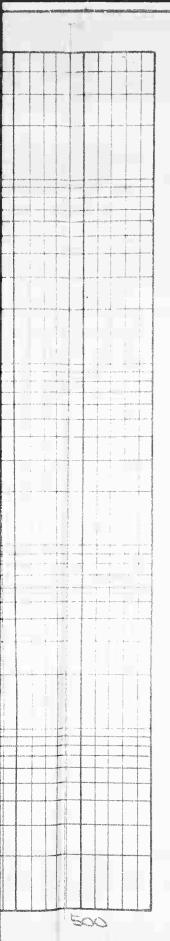
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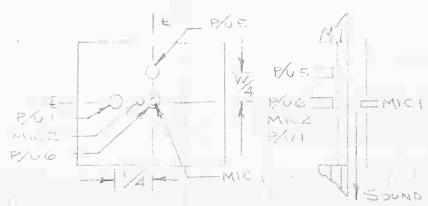
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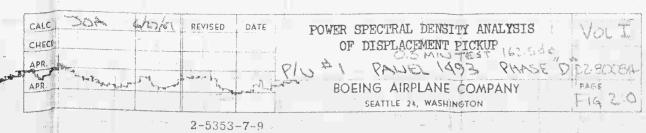


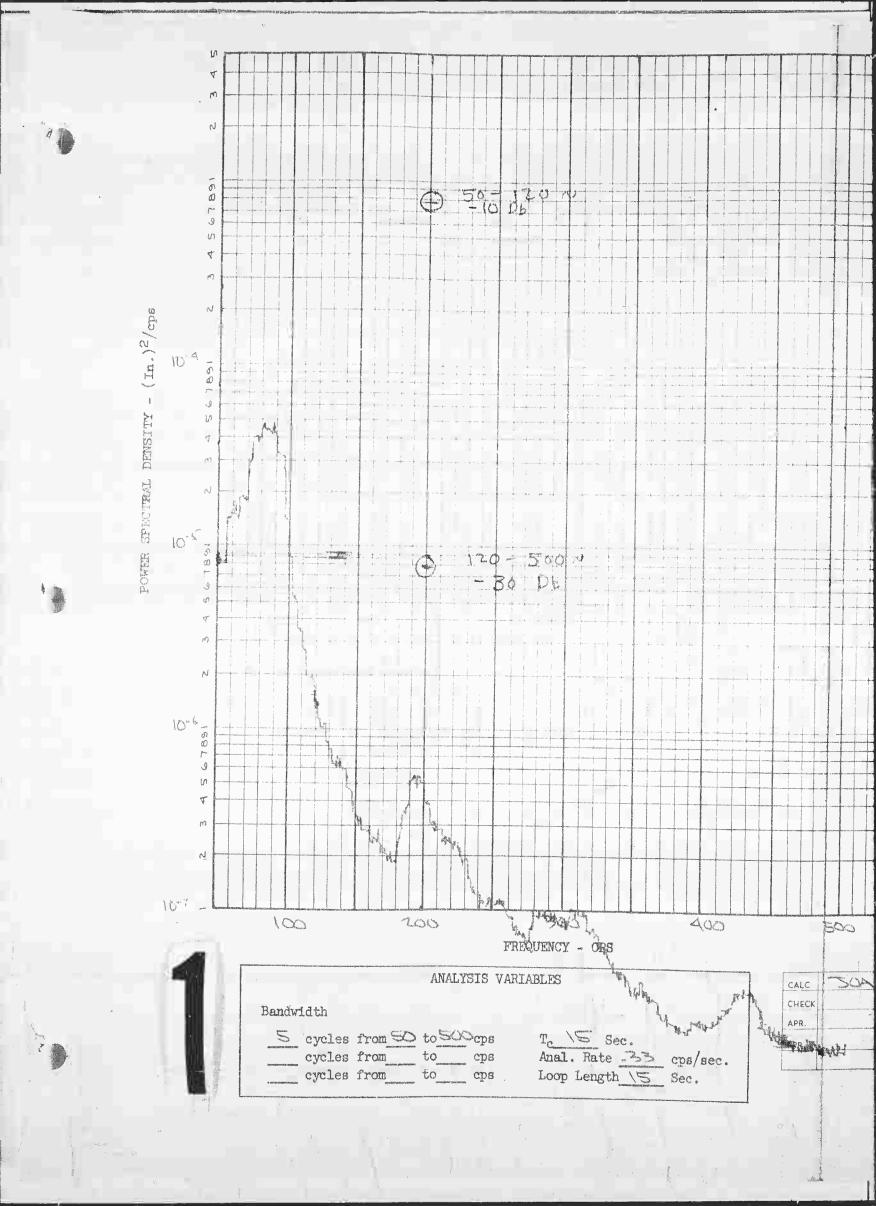


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EWA No. 5-59	ingen and an extra restriction is the control of th	Market Street or other Designation of the Street Street	Specimen No.	
Tape No.	Tape Char	mel 3	Displacement	Pickup i
Elapsed Test Time	57112		Level at Sonic	Lab.
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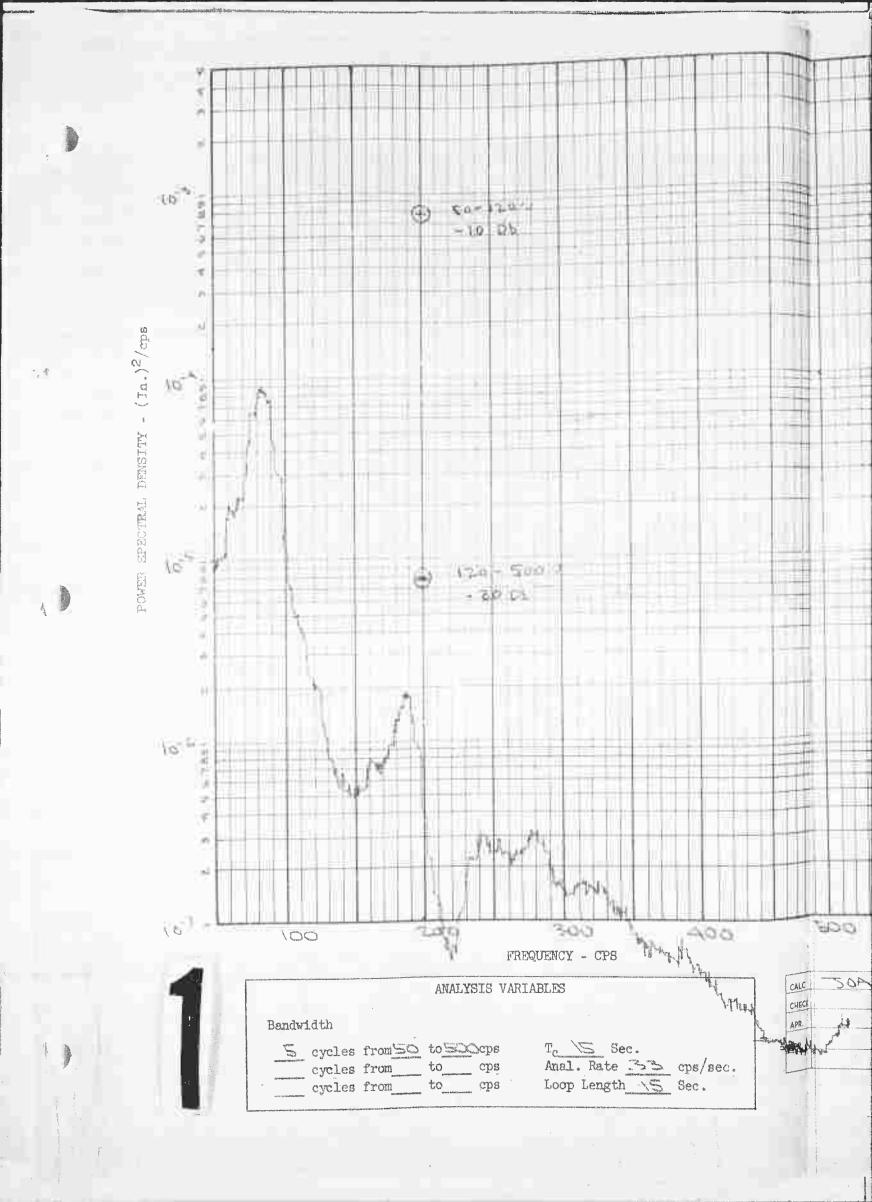
Selectivation of the selection of the se	and the second s	and a rood annual community with a surfer of a first of interest to the well-sufficiently interest of interest to be				
Tape No.	Tape Channel	Data Tape RMS Volt $V_{R} = 170$				
Calibration Voltage $V_a = .5 V_{rms}$ into Line Amp.; $V_e = .48 V_{rms}$ on Tape @200cg						
Line Amplifier Set- For Calibration (G. = 500; for Data	C _d = .100				
Lab. Gain LG = \	Tape Monitor Gain	$TMG = \frac{Gd}{U_C} = .7$				
Displacement Pickup S = 035 \in. /Vo						
	Equivalent of Calibration - in. D _c = V _a · S = _ONT					
	Equivalent of Calibration for PSD Flots $ \left(\frac{P_{c}}{(TMC)(LG)}\right)^{2} = \left(\frac{.011}{(2)(1)}\right)^{2} = \frac{1}{2} \times 10^{-3} \text{ in.}^{2}/\text{cps} $					
Analyzer Attenuator Setting Log Converter Setting -10 -30 -30 -30 -30 -30 -30						
Calibration Plotted	7.8 (10 H	n y				
Overall Deflection	Overall Deflection Level of Data					
RMS Defl. Level =	(D _C)(V _R) (ON) (TMG)(LG)(V _C) (ON)	77)(170) = 0314 12 . K1)(48) = 0314 12 .				

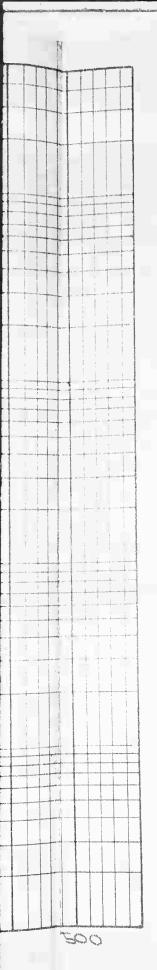






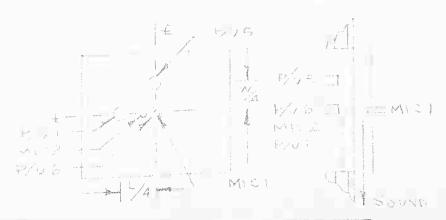
DATA IDENTIFICATION Test Title PALLEL ATTACH TYPE I ~ PRELIM. EWA No. 5-593 Panel or Specimen No. 1498 Displacement Pickup Tape Channel Elapsed Test Time P/U RMS Level at Sonic Lab. +60.5 MIN $V_{L} = Volts$ CALIBRATION Data Tape RMS Volt Tape No. Tape Charmel VR = . Z/O Calibration Voltage Va = 5 Vrms into Line Amp.; Vc =485 Vrms on Tape @Zoocps Line Amplifier Settings For Calibration Gc = 500; for Data Gd = 100 Tape Monitor Gain TMG = Gd : 7 Lab. Gain LG = \ O Displacement Pickup Schsitivity S = .0354in./Volt Equivalent of Calibration - in. D = Va · S = O/77 Equivalent of Calibration for PSD Plots $\frac{D_{a}}{(TMG)(LG)}^{2} = \left(\frac{O(T)}{(2)(O)}\right)^{2} = 7.8 \times 10^{-3}$ Analyzer Attenuator Setting Only Log Converter Setting Calibration Plotted at (100%) in.2/cps Overall Deflection Level of Data RMS Defl. Level = $\frac{(D_c)(V_R)}{(TMG)(LG)(V_c)} = \frac{(OCT)(2CG)}{(CZ)(1)(ASS)} = 03831n$. 500 SOA WEVISED REVISED DATE CALC POWER SPECTRAL DENSITY ANALYSIS Walley Land OF DISPLACEMENT PICKUP CHECK P/U#5 PANEC 1438 PHASE"O DZ-80061 APR PAGE BOEING AIRPLANE COMPANY F16 211 SEATTLE 24, WASHINGTON



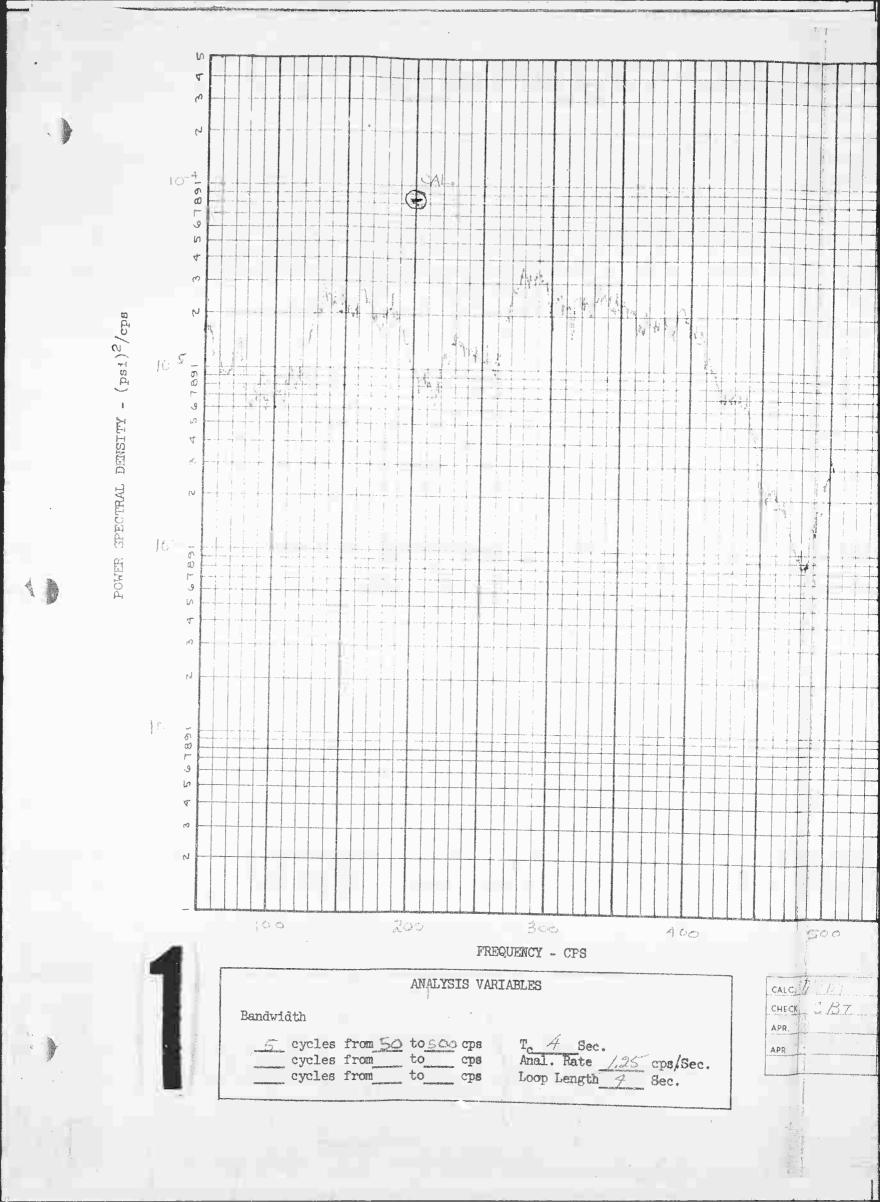


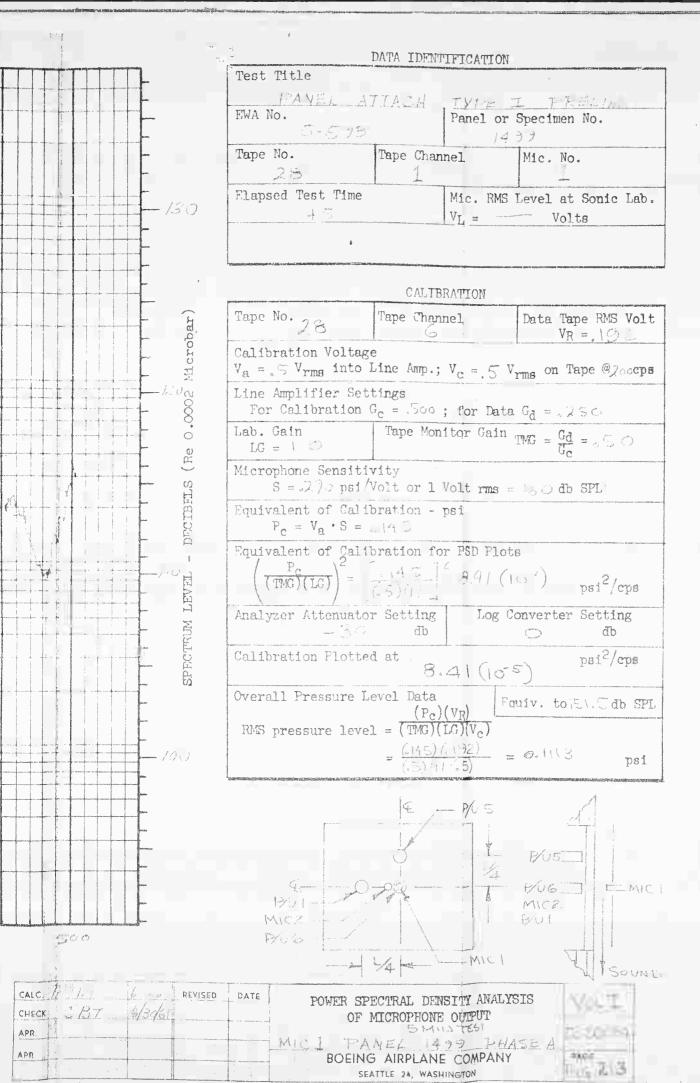
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EWA No. 5-503	ika maranaka da da da maranaka maranaka da da maranaka maranaka da		Specimen 498	
Tape No.	Tape Chan	nel.	Displace	ement Pickup
Elapsed Test Time	(1 L) a		Level at S	
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		The state of the s
Tape No.	Tape Channel	Data Tape RMS Volt VR = . 250
Calibration Voltage Va = .5 V _{rms} into I	e Line Amp.; V _c = 48	35V _{rms} on Tape @ 200cps
Line Amplifier Sett	c = 500; for D	col. = 50 ste
Lab. Gain LG = \.O	Tape Monitor Ga	$ \frac{1}{G_{c}} = \frac{G_{d}}{G_{c}} = \frac{1}{2} $
Displacement Pickup 8 7.0354 in./Vo.		
Equivalent of Calif	Carl man	
	(1)(1)	1.8 x 10-3 la.2/eps
Analyzer Attenuato	r Setting Lo	og Converter Setting Odb
Calibration Plotte	7 53	()6"") in.2/cps
Overall Deflection	Level of Data	
RMS Defl. Level =	$\frac{(D_c)(V_R)}{(TMG)(LG)(V_C)} =$	(0177/250) 04551n.



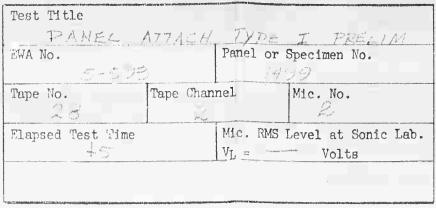
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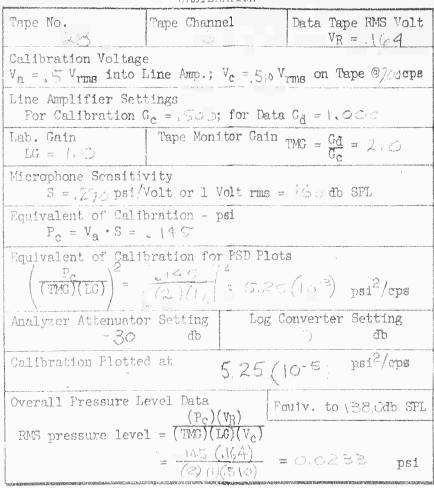


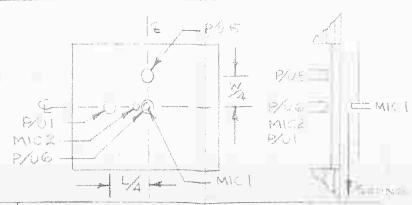
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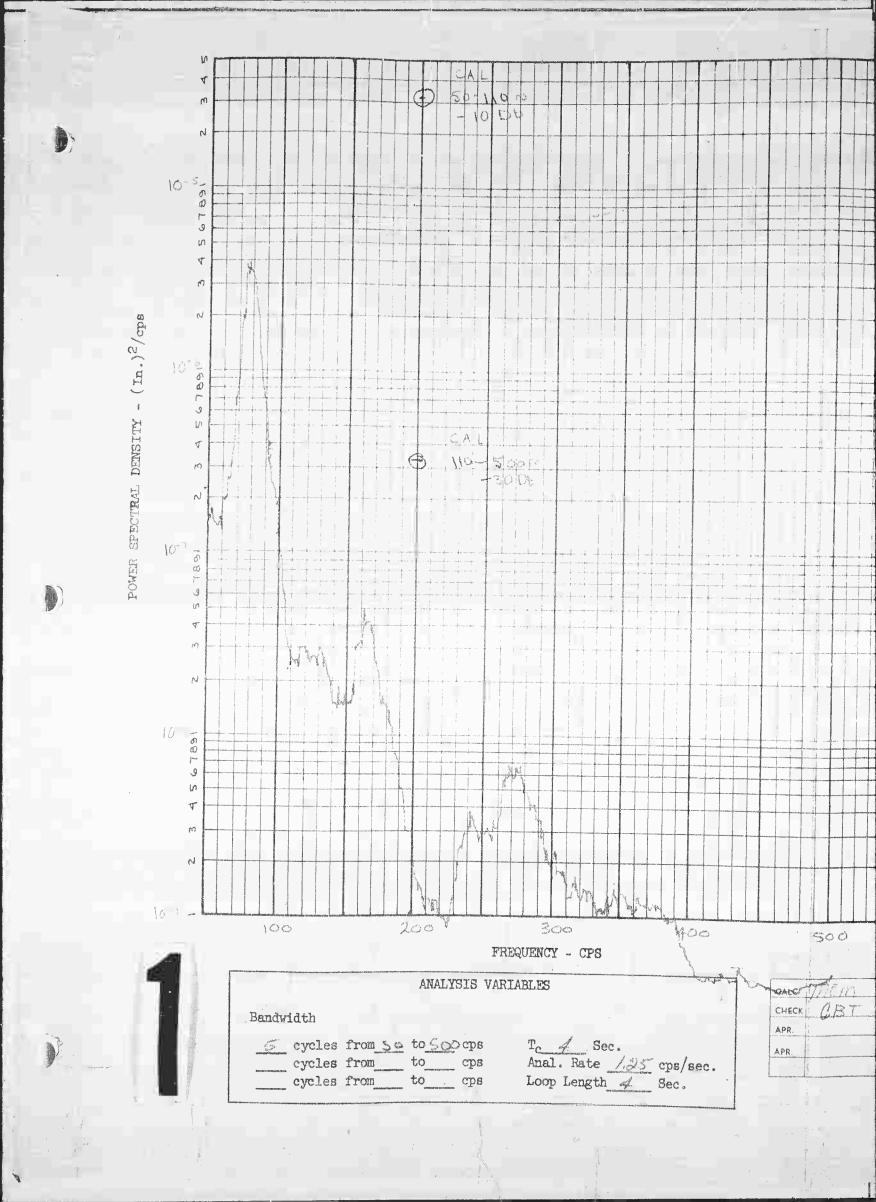
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Test Time

PANEL ATTACH

Panel or Specimen No.

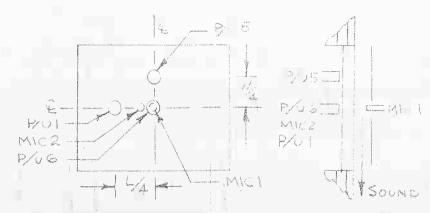
Flapsed Test Time

P/U RMS Level at Sonic Lab.

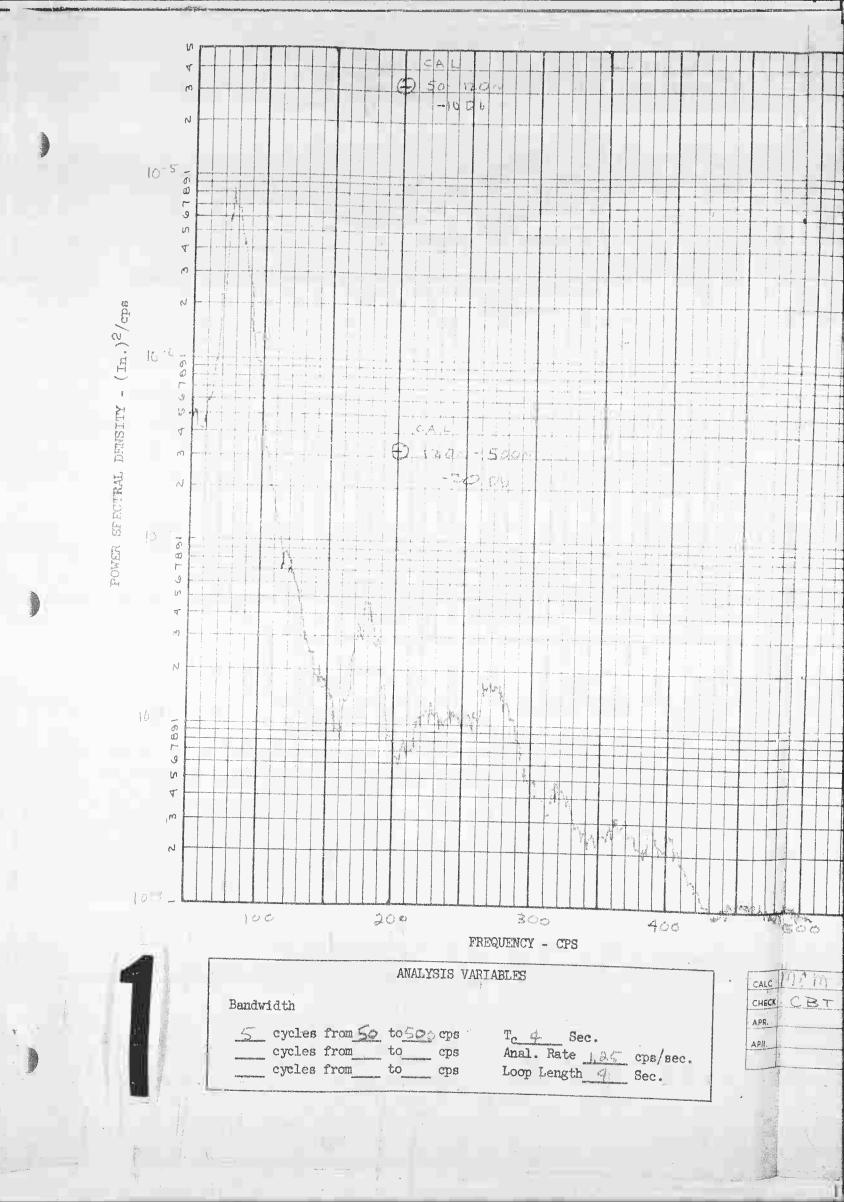
VL = 32/0 Volts

CALIBRATION

Tape No.	Tape Channel	Data Tape RMS Volt				
Calibration Voltage $V_a = .5 V_{rms}$ into I		OV _{rms} on Tape @ <i>100</i> cps				
Line Amplifier Seti For Calibration ($i_{a} = .500$: for Da	ta Gd = 0500				
Lab. Gain LG = 1.0	Tape Monitor Gai	$n_{TMG} = \frac{Gd}{Gc} = /. \bigcirc$				
Displacement Pickup S = .0534 in./Vol	Sensitivity					
Equivalent of Calib						
Equivalent of Calibration for PSD Plots $\left(\frac{D_{c}}{(TMG)(LG)}\right)^{2} = \left(\frac{O(177)^{2}}{(1177)^{2}} - 3.15 (10^{-4})\right)$ in.2/						
Analyzer Attenuator Setting Log Converter Setting						
Calibration Plotted	16 M. philiphipalate. A chief. American company of the analysis. Burnings. Burnings.	50011014				
3.15(10") 10-500~ in.2/cps						
Overall Deflection	Overall Deflection Level of Data					
RMS Defl. Level =	$\frac{(D_{\rm G})(V_{\rm R})}{({\rm IMG})(LG)(V_{\rm C})} = \frac{2}{0}$	our (3)				



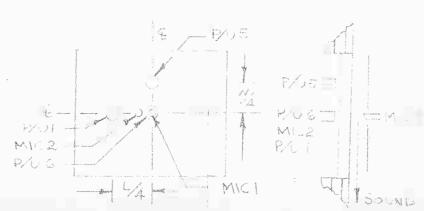
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Test Title	DATA IDEN	TIFICATION		
EWA No. 5-59:		Panel or	J PREL Specimen No.	IM
Tape No. 28	Tape Chan	nel	Displacement	Pickup #
Elapsed Test Time	5	P/U RMS L VL = _ 3:	evel at Sonic	Lab.
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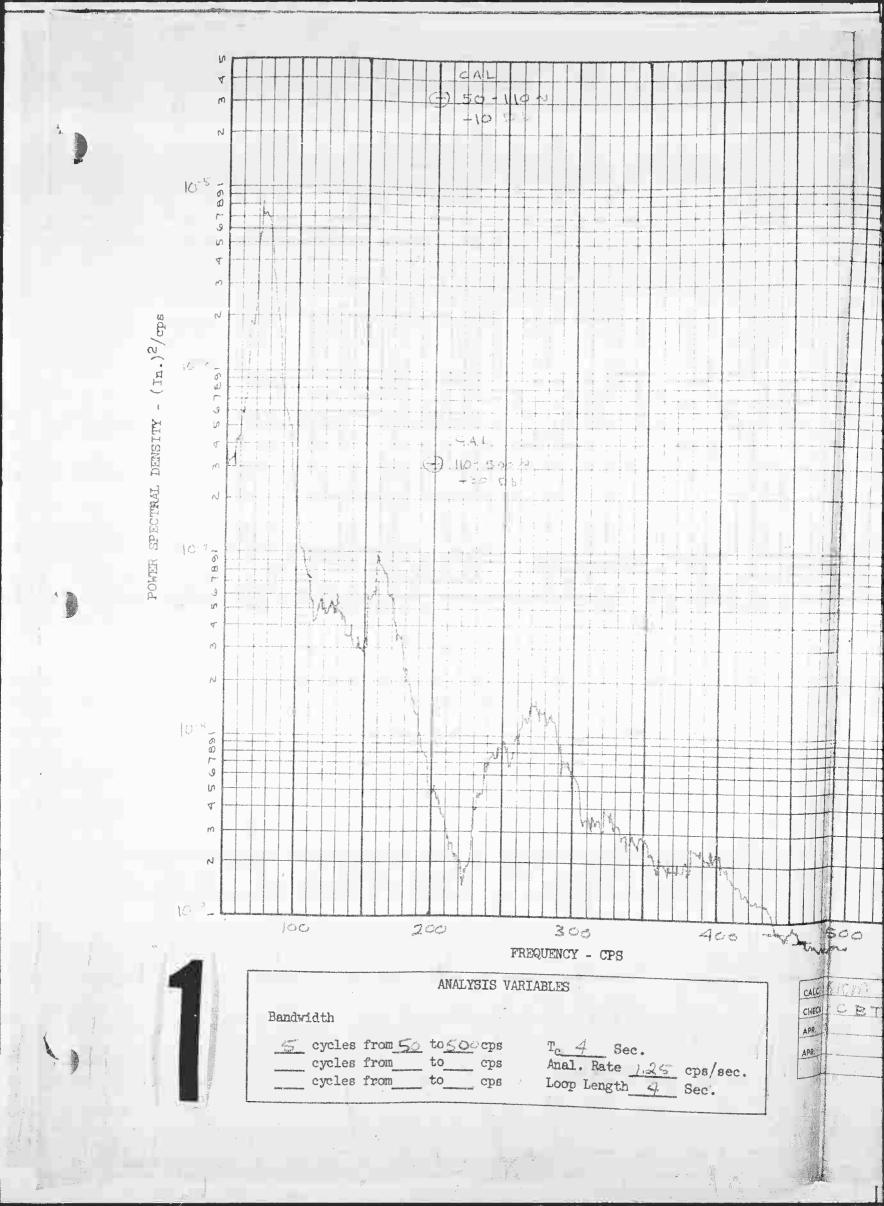
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Tape No. 28	Tape Channel		RMS Volt
Calibration Voltage Va = .5 V _{rms} into I	ine Amp.; V _c =	d a China quantum appartum qui propositi de inicia considerangen materia de china della cigni quanti materia a Tanta	Markahipilang dan balan da gahi gar-i ngkar urtipalang penghapilangan pensasian
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Lab. Gain LG = U O	Tape Monitor	Gain TMG = Gd =	The state of the s
Displacement Pickup 8 = .0584in./Vol	Sensitivity	- Sometime of the state of the	EPTO pried EBEN kon hvall adde litera et ligenskip indynn Stronbalmerke et egenlijen.
Equivalent of Calib $D_c = V_a \cdot S = \dots$		et et ligh sedeling omge verview om in self-ner nev er even meller	Polymer projectivi di Salandar venera renga georgigi i regisiologistik geo
Equivalent of Calib $\left(\frac{D_{C}}{(TMG)(LG)}\right)^{2} = \frac{1}{LG}$	ration for PSD	Plots 2.13(10 ⁻⁴)	in.2/cps
Analyzer Attenuator	Setting I	og Converter Se	etting ab
Calibration Plotted	At the Track	7 80 2 ×	· sandatina
Overall Deflection	Level of Data		manufacturing 400 mininger and chamberlands all all all as but contact - because of
RMS Defl. Level =	$(D_c)(V_R)$ $(MG)(LG)(V_C)$	(1)(1)(555)	oasin.



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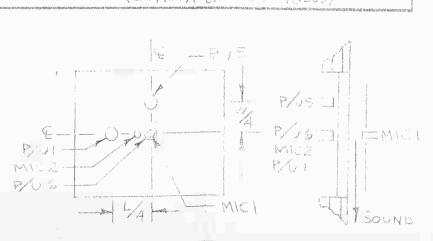


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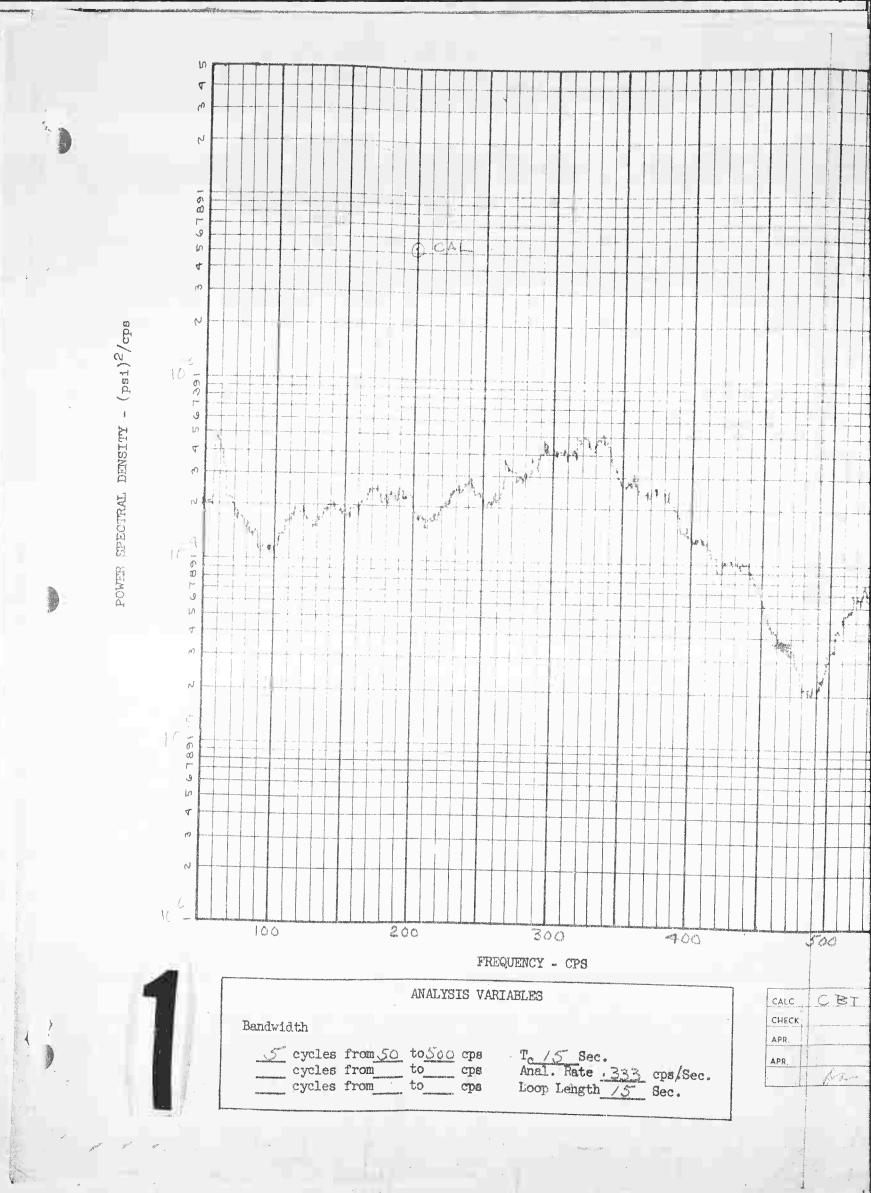
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Tape No.	Tape Chan	nel	Displacement Pickup
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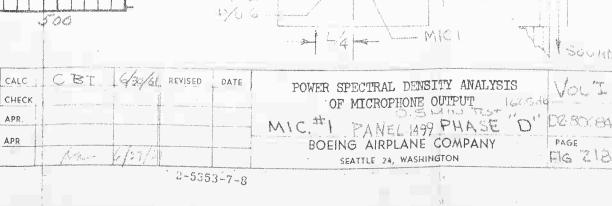
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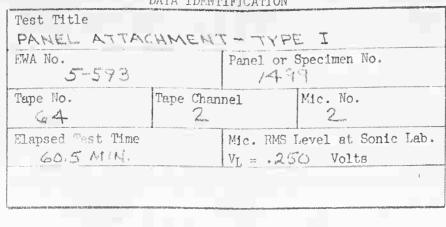
the country for all the same of the same o	CALIDRATION				
Tape No. 28	Tape Channel	Data Tape RMS Volt $V_R = .315$			
Calibration Voltage Va = _ 5 V _{rms} into I		V _{rms} on Tape @ 100 cps			
Line Amplifier Sett For Calibration (5 = 566 : For Dat	ta Gd = .Scc			
Lab. Gain LG == 1, Ce/	Tape Monitor Gair	$^{1} \text{ IMG} = \frac{Gd}{Gc} = 1, C$			
Displacement Pickur S = ,0%S4 in./Vol	Sensitivity	A STATE OF THE STA			
Equivalent of Calib $D_c = V_a \cdot S = .C$		And the state of t			
Equivalent of Calib $\left(\frac{D_{C}}{(\text{TMG})(\text{LG})}\right)^{2} = \int_{C} C$	ration for PSD Plo				
Analyzer Attenuator	Setting Log	Converter Setting O db			
Overall Deflection Level of Data					
RMS Defl. Level =	$(\mathrm{D_C})(\mathrm{V_R})$ $(\mathrm{IMG})(\mathrm{LG})(\mathrm{V_C})$	TTT (5) OTTO THE STATE OF THE			



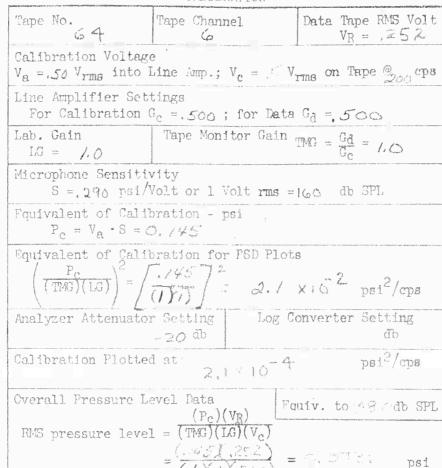
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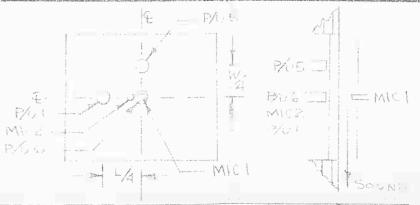






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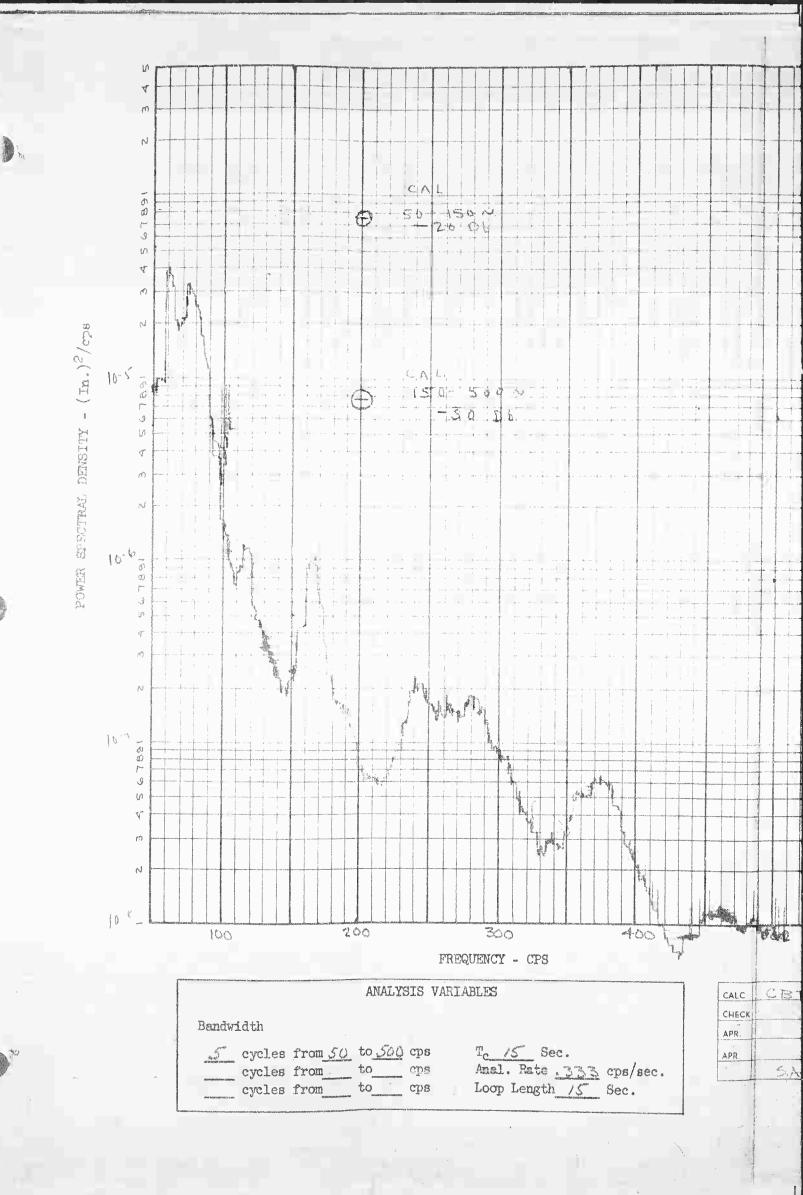




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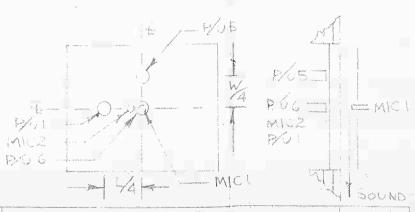




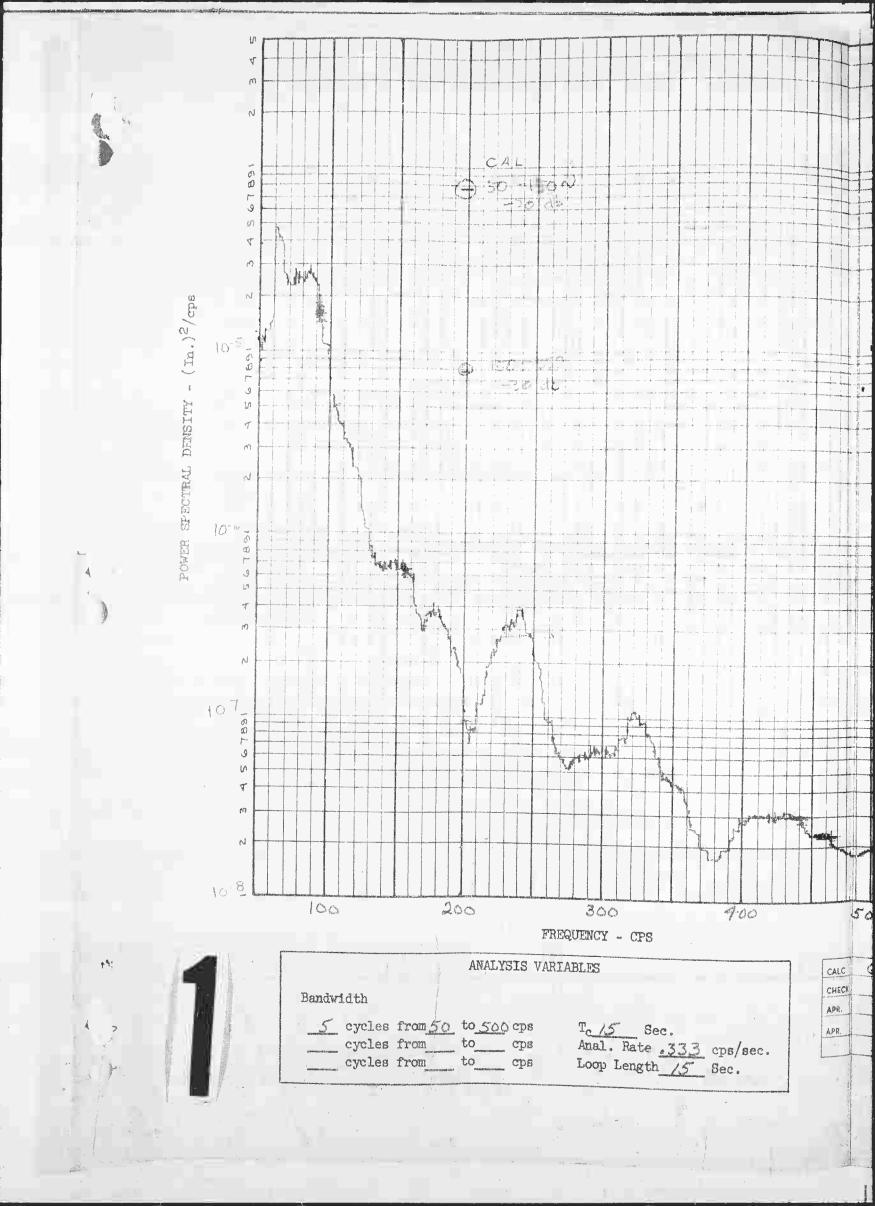
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EWA No. 5-573			Specimen No.
Tape No.	Tape Chann	el	Displacement Pickup
Elapsed Test Time 60.5 MIN.	The second secon	1.	Level at Sonic Lab. 05 Volts
*** ABERDATA A PARTIE OF THE PROPERTY OF TH	The fraction and the grammer areas and a section of the contraction of	80° Piliting Marillo processor from 10° 6.376cm. gr	ED-4 SQC consisted of all principles graphs are up to a challenged and a functional of property and

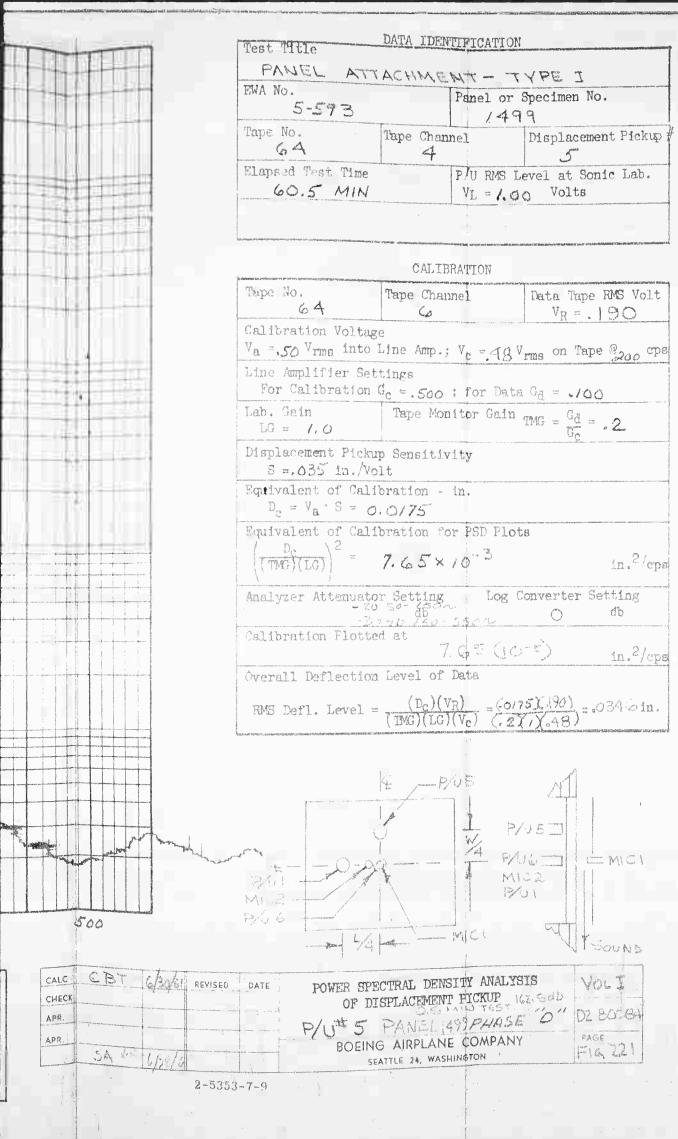
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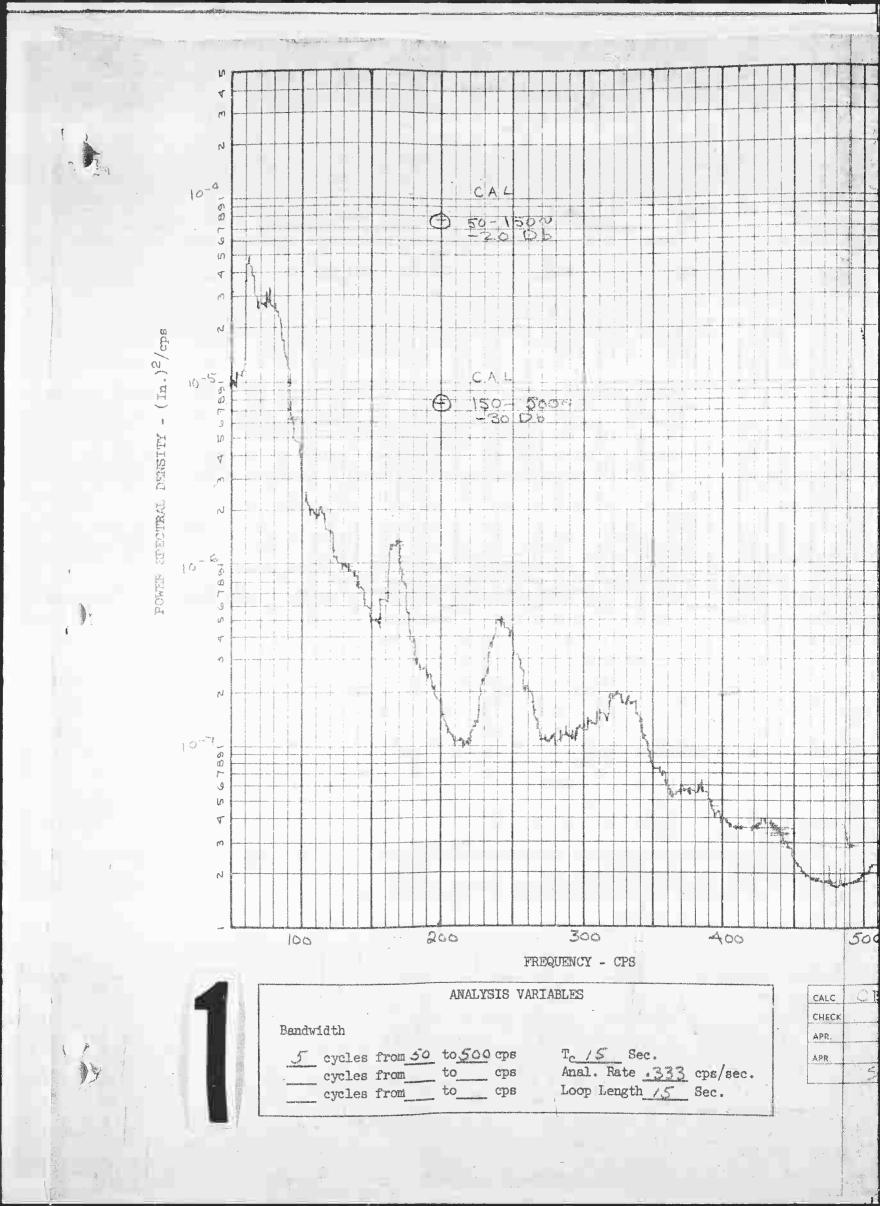
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Tape No.	Tape Channel	Data Tape RMS Volt
64	6	$V_{R} = .175$
Calibration Voltag		
Va 550 Vime into	Line Amp.; $V_c = .46V$	rms on Tape @200 cps
Line Amplifier Set For Calibration (1 - ran - fam Data	Ga =. /00
Leb. Gain LC = /.0	Tape Monitor Gain	$TMG = \frac{G_d}{G_c} = .2$
Displacement Pickur S =.035 in./Vo		
Equivalent of Cali		,
Equivalent of Cali	bration for PSD Plot	8
(TAG) (IG)	$\begin{bmatrix} 0.775 \\ 2X11 \end{bmatrix} = 7.65$	x 10 ⁻³ tn. ² /cps
Analyzer Attenuato	r Setting Log C	onverter Setting
Calibration Plotte	And the second s	(16,-5) in.2/ops
Overall Deflection		
RMS Defl. Level =	(Dg)(VR) (.017 (IMC)(LG)(Ve) (.2)	78 X.175) = ,0319 in.
THE PROPERTY AND ASSESSMENT OF THE PROPERTY ASSESSMENT OF THE PROPERTY OF THE		



CALC	CBT 6/50/51 REVISED	DATE	POWER SPECTRAL DENSITY ANALYSIS
CHECK			OF DISPLACEMENT PICKUP 62555
APR.	And the second s	The state of the s	P/U" PANEL 1499 PHASE D DE-SCORA
APR.			BOEING AIRPLANE COMPANY PAGE
	5 A Bring (1886)		SEATTLE 24, WASHINGTON FIG. 220



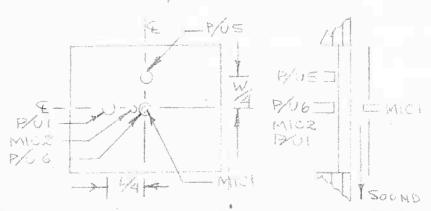




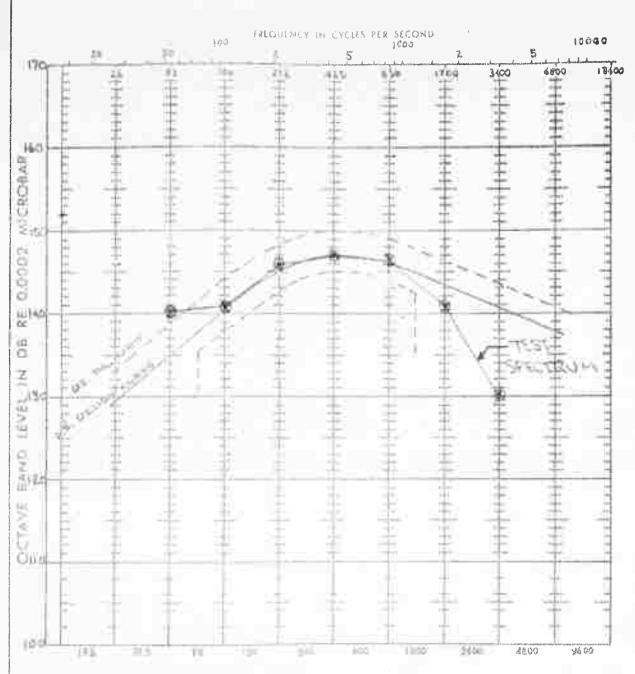
DATA IDENTIFICATION Test Title PAMEL ATTACHMENT - TYPE I Panel or Specimen No. EWA No. 5-573 1499 Tape Channel Displacement Pickup Tape No. 5 64 P/U RMS Level at Sonic Lab. Elapsed Test Time VL = . 900 Volts 60.5 MIN.

CALIBRATION

Tape No.	Tape Channel	Data Tape RMS Volt
Calibration Voltage Va = 50 Vrms into I		V _{rms} on Tape 200 cps
Line Amplifier Sett For Calibration (1 - Fan Dot	a G _d = .100
Lab. Gain LG = 1.0	Tape Monitor Gain	$\frac{G_{d}}{G_{c}} = \frac{G_{d}}{G_{c}}$
Displacement Pickup 8 = .035 in./Vol	Sensitivity -	
Equivalent of Calib $D_c = V_8 \cdot S = .0$		
-	bration for PSD Plo	t B
$\left(\frac{D_{C}}{(DC)(LG)}\right)^{2}$	7.65 × 15 3	in. ² /cps
Analyzer Attenuator	r Setting Log	Converter Setting
Calibration Plotter	7 at /	(-, 17) in.2/cps
Overall Deflection	Level of Data	ersterning var vang get dige de geven de geografische der der der som der vereigten er vereigen de der de de vereigten der der vereigten der
RMS Defl. Level =	$\frac{(D_{\rm c})(V_{\rm R})}{(TMG)(LG)(V_{\rm c})} = \frac{6C}{6.2}$	75X-50) = .0328in.



CALC 5 1 10 13 14 KI	POWER SPECTRAL DENSITY ANALYSIS	Van T
CHECK	OF DISPLACEMENT PICKUP	A give date: should
APR.	Plute DENINTET PHASE 'D"	T2: 5 T. 64
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5A 17 6/3/6	SEATTLE 24, WASHINGTON	Fri 1 Ga Zalala



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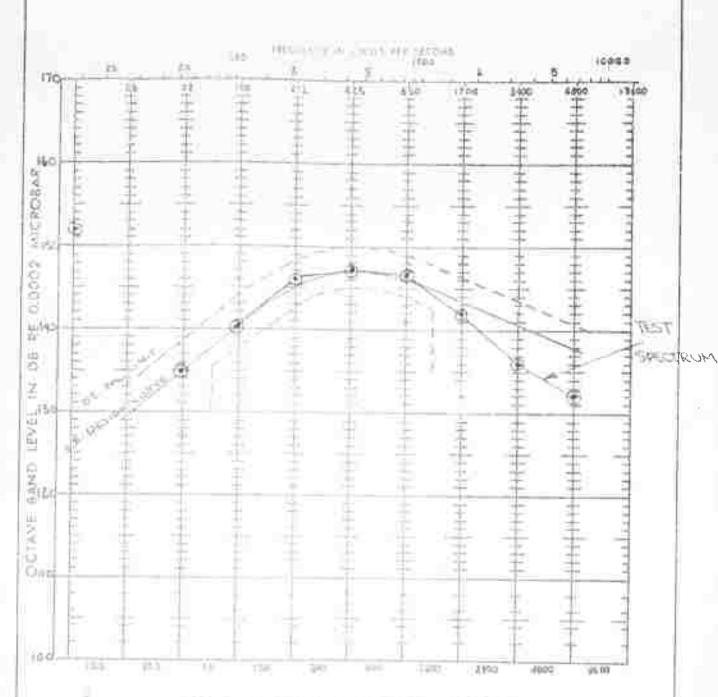
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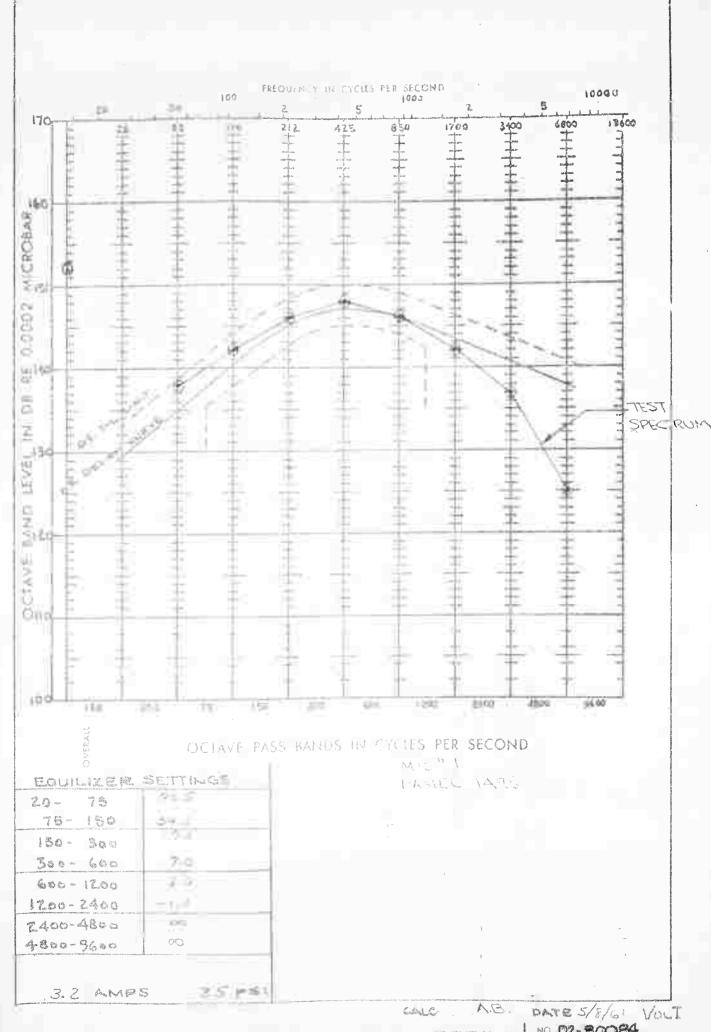
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SONIC LAB. PAGE FIG 224

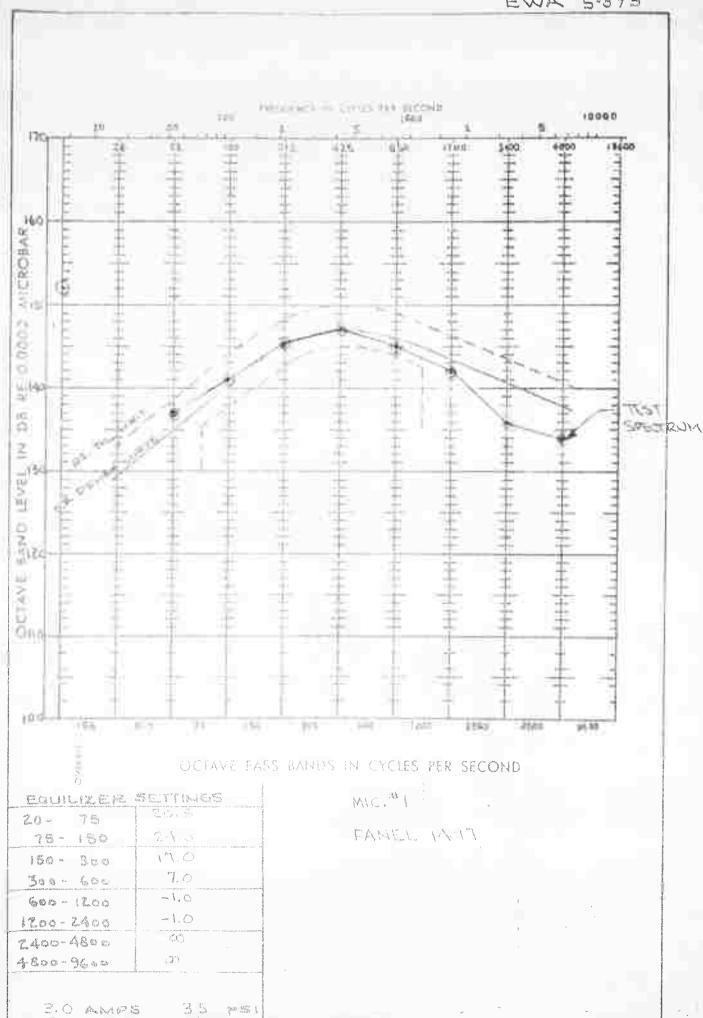
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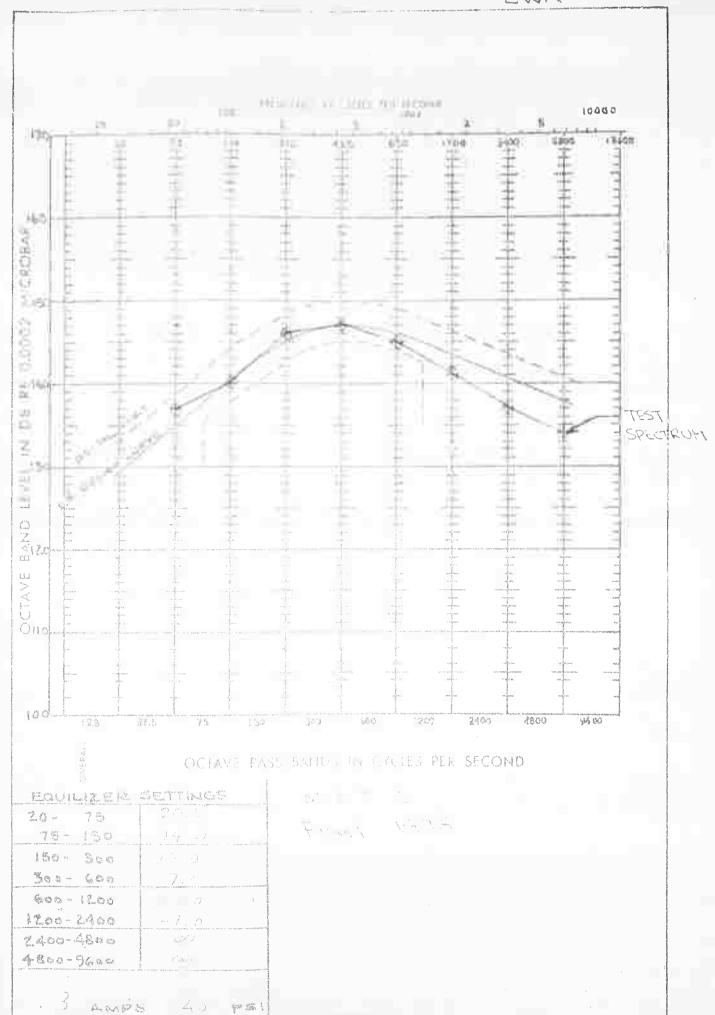
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SONIC LAB. PAGE FIGTES.



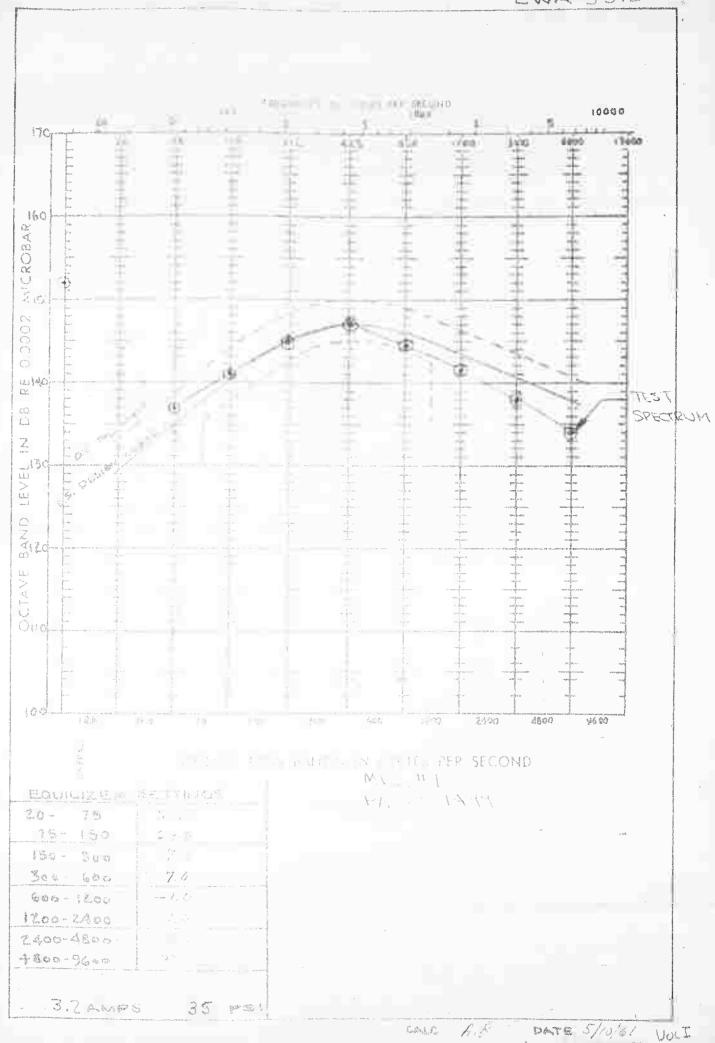
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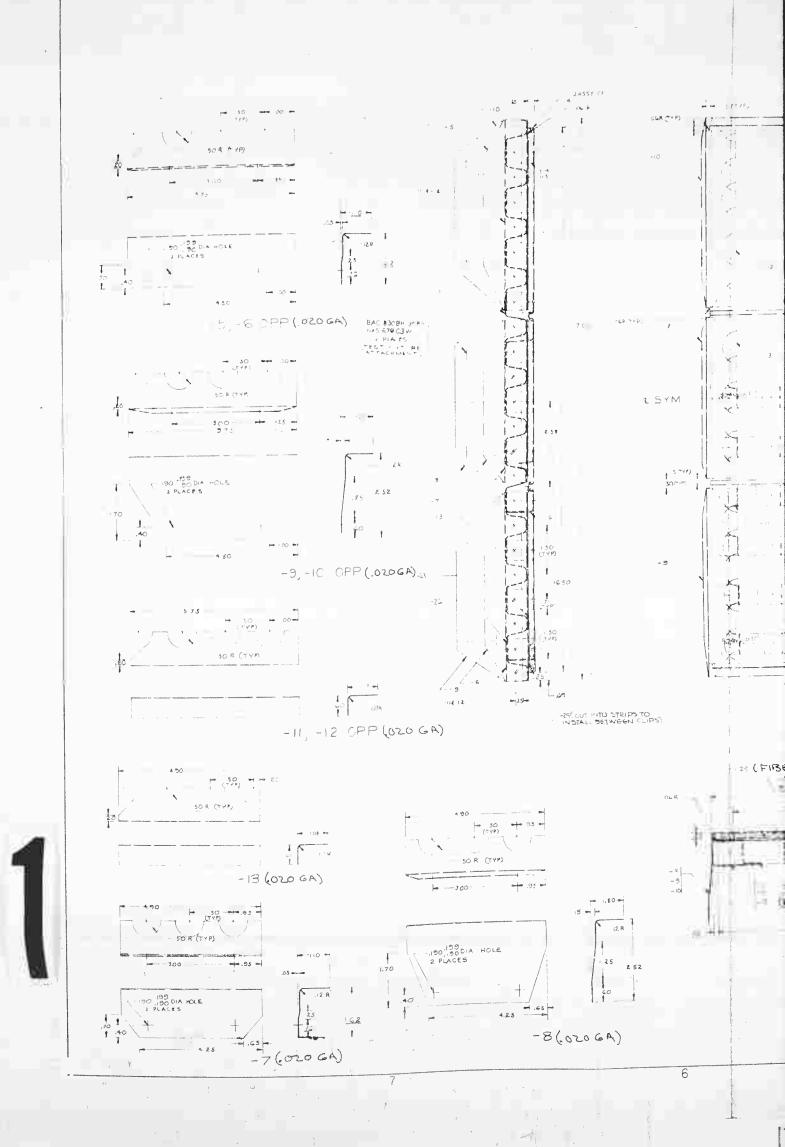
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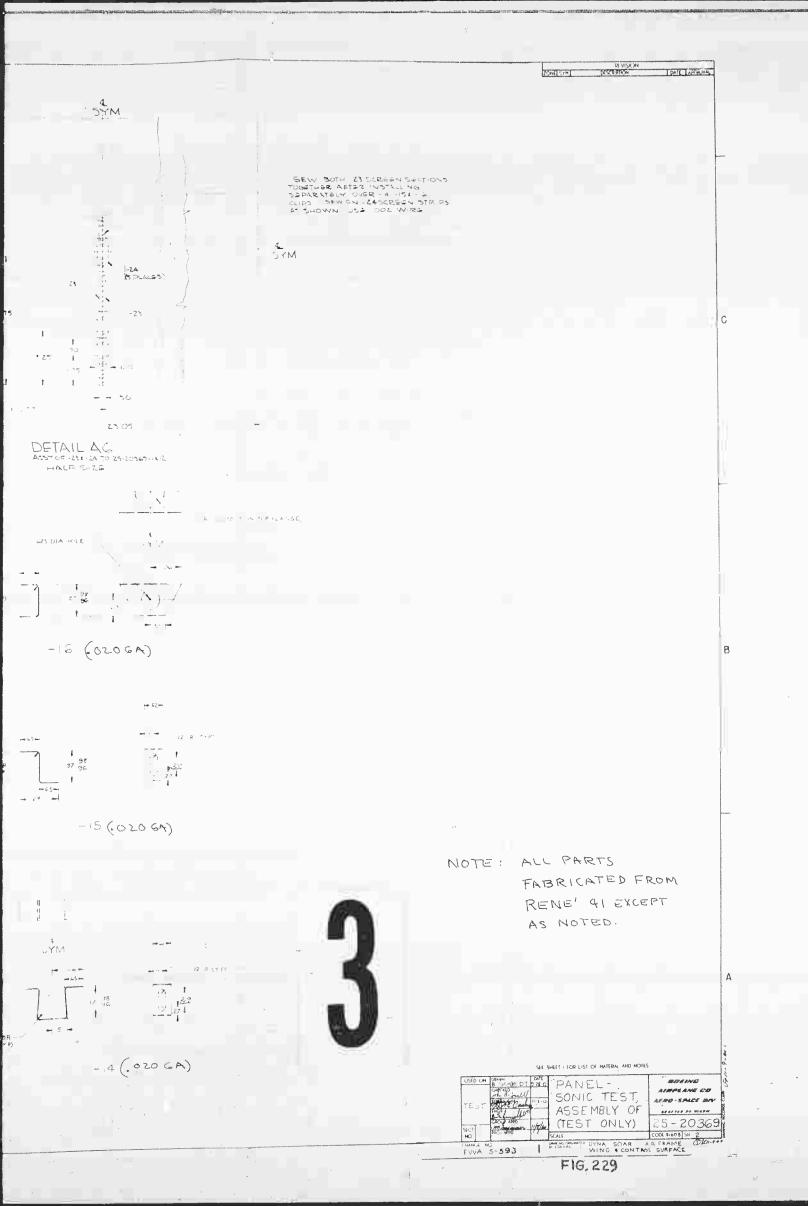
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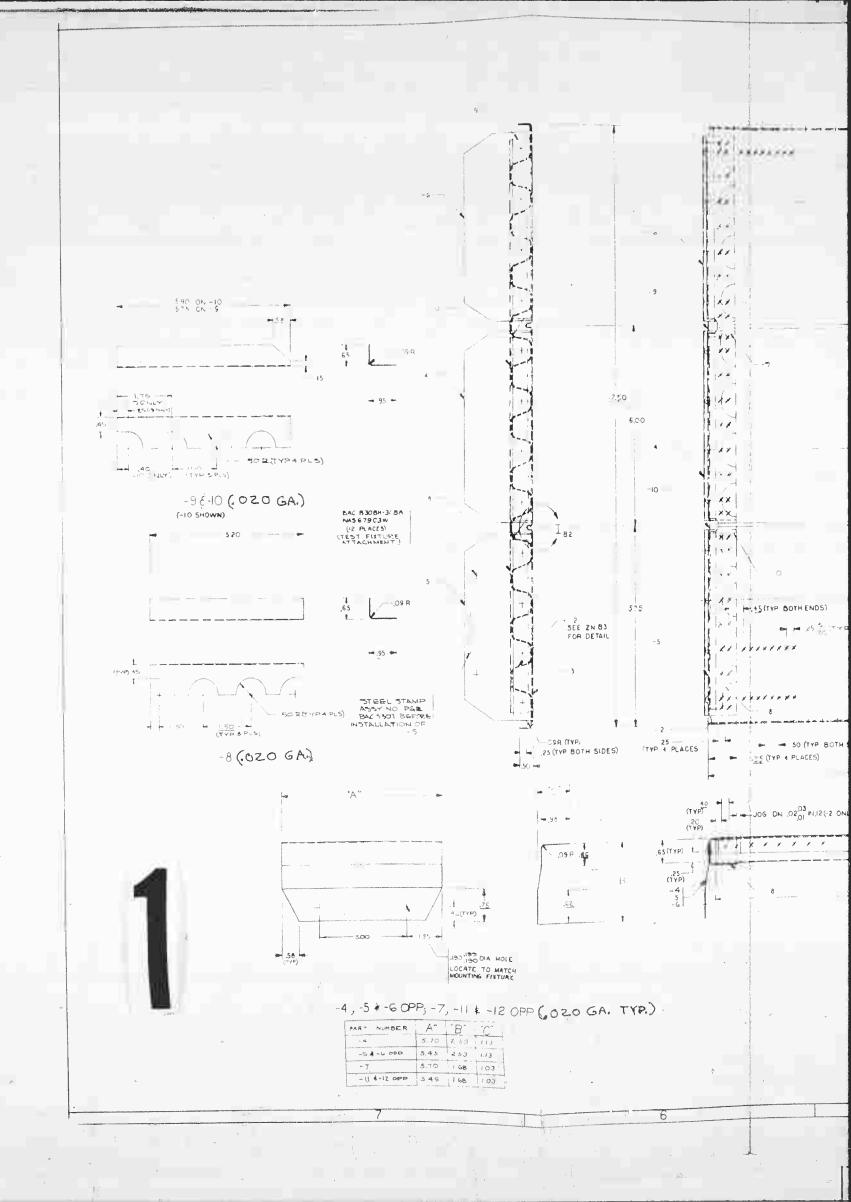
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Second Mary



(AGREOL) 25 (poz GN) (INCONEL 200 MESH CLOTH) 4 (OOZ GA) (INCONEL ZOO MESH CLOTH) 25 (FIBERFAX -BLANKET TYPE INSUL) EE DETAIL AGH SEE DETAIL AGES 111/66 17 (010 GA) 13 (PAPER INSUL) 10.00 (PAPER INSUL) 22.3 PANEL A J 17 OF 25-20369-1 6





(TYP) 10 (TYP) 1.50 (TIP FOR RIVETS & SPOT WELDS) CORRUGATION & SPOT WELD TYP HA.+5(TYP BOTH ENDS) -12] -9 BAC PISCE SEMBL 24 PLACES) JE ROTYP 4 FLACES) ► - 50 (TYP BOTH SIDES) 1.25 (TYP 4 PLACES) .25 ← (TYP) JOS DN OSOJIM JE - (TYE) (1710 8) STM 10'SO' NO SOUTH 1(.008 GA.) 2 (010 GA.) 25-20344-1 ASSEMBLY OF

NOTE: ALL PARTS FABRICATED FROM RENE' 41. TWICE SIZE DETAIL I

F FOR RIVETS & SPOT WELDS

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OF,

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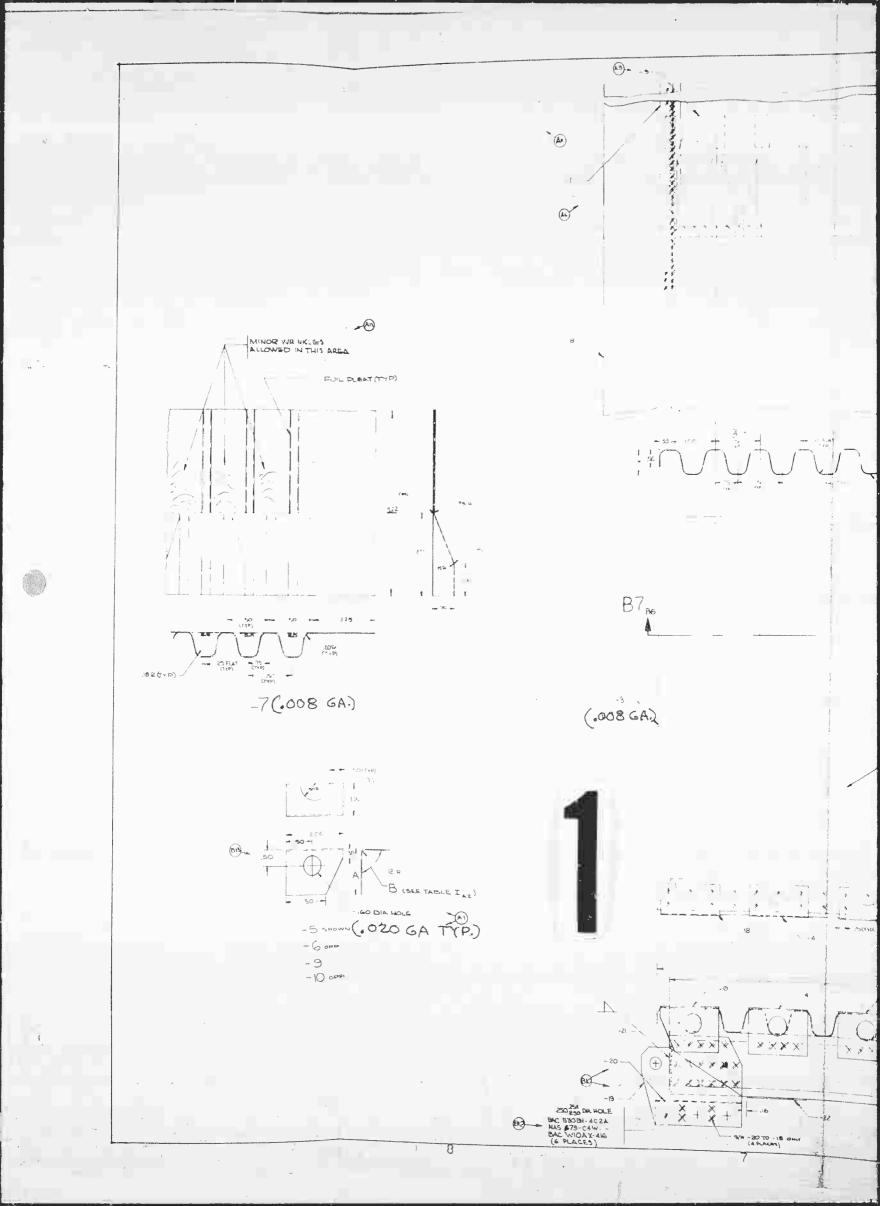
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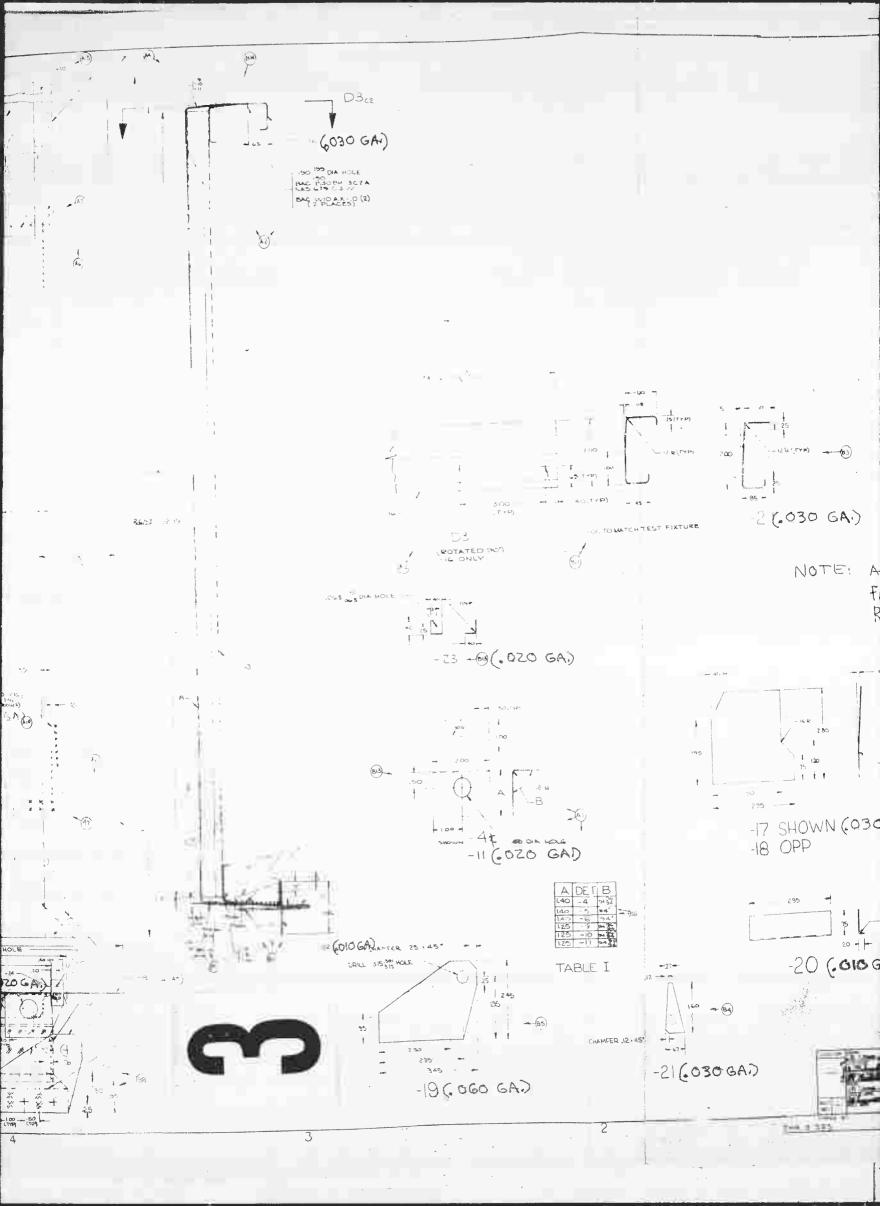
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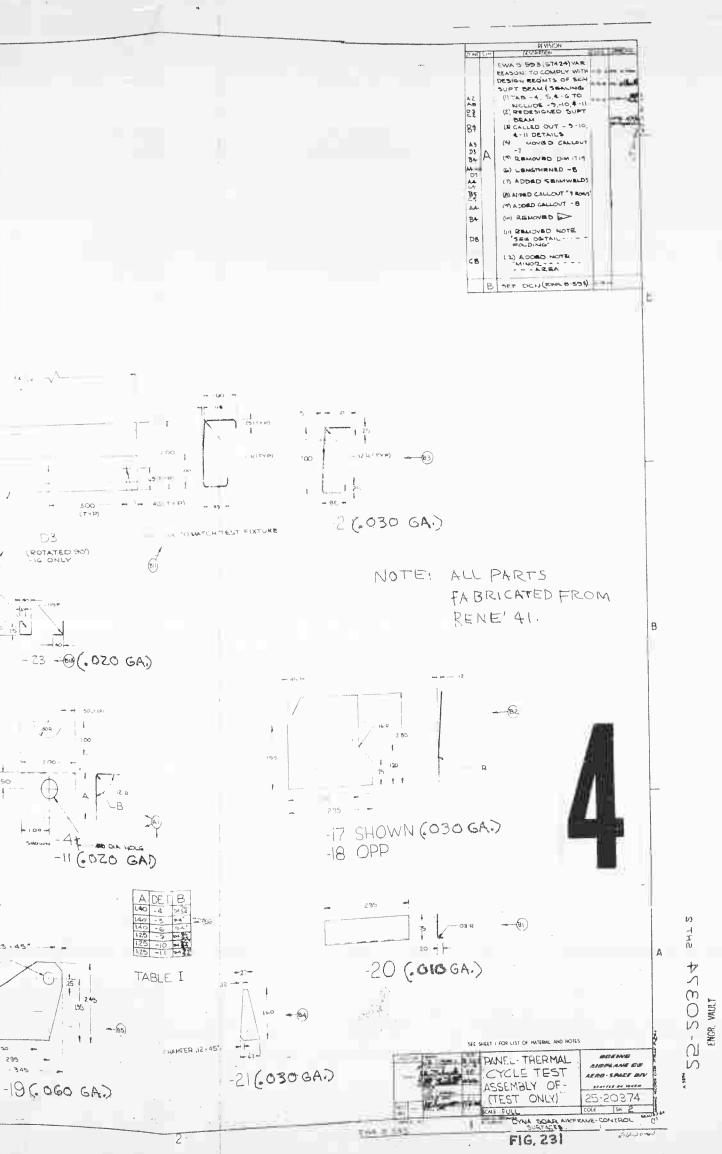
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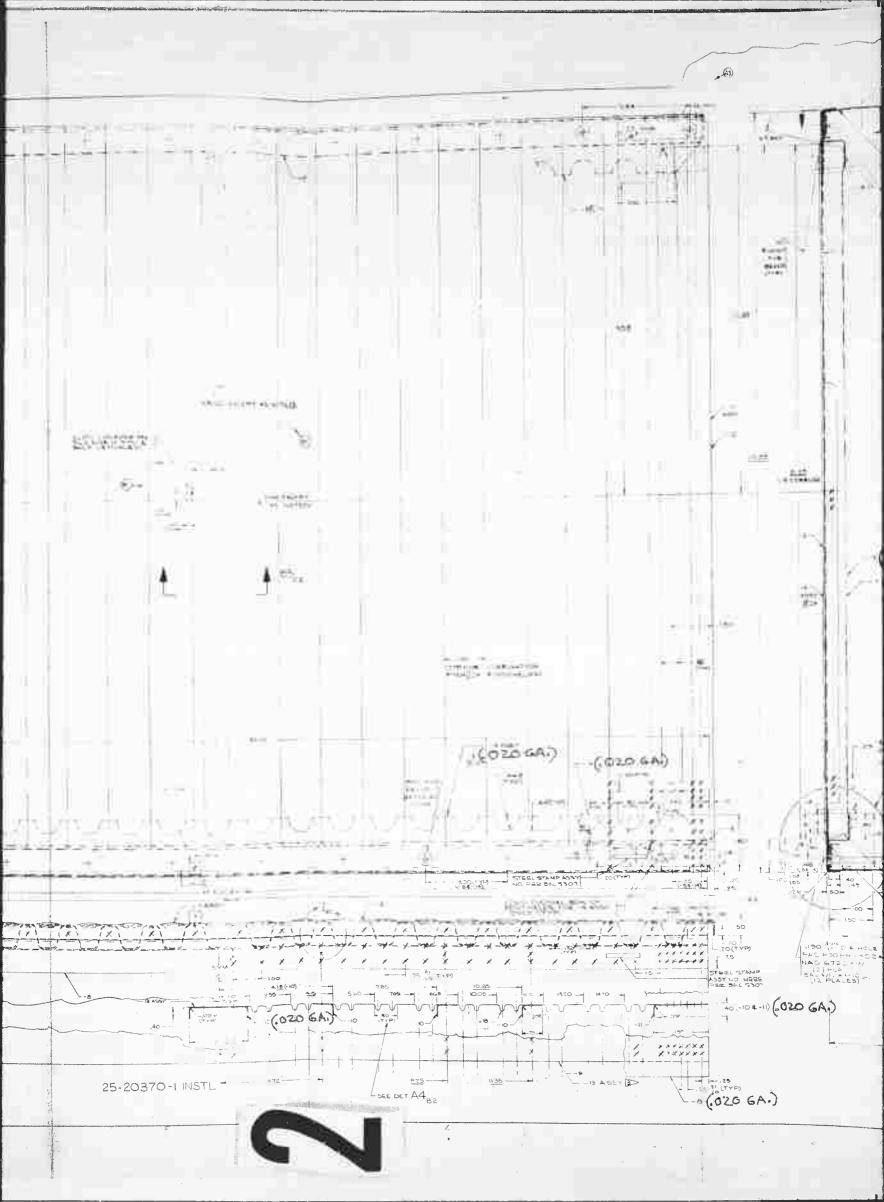


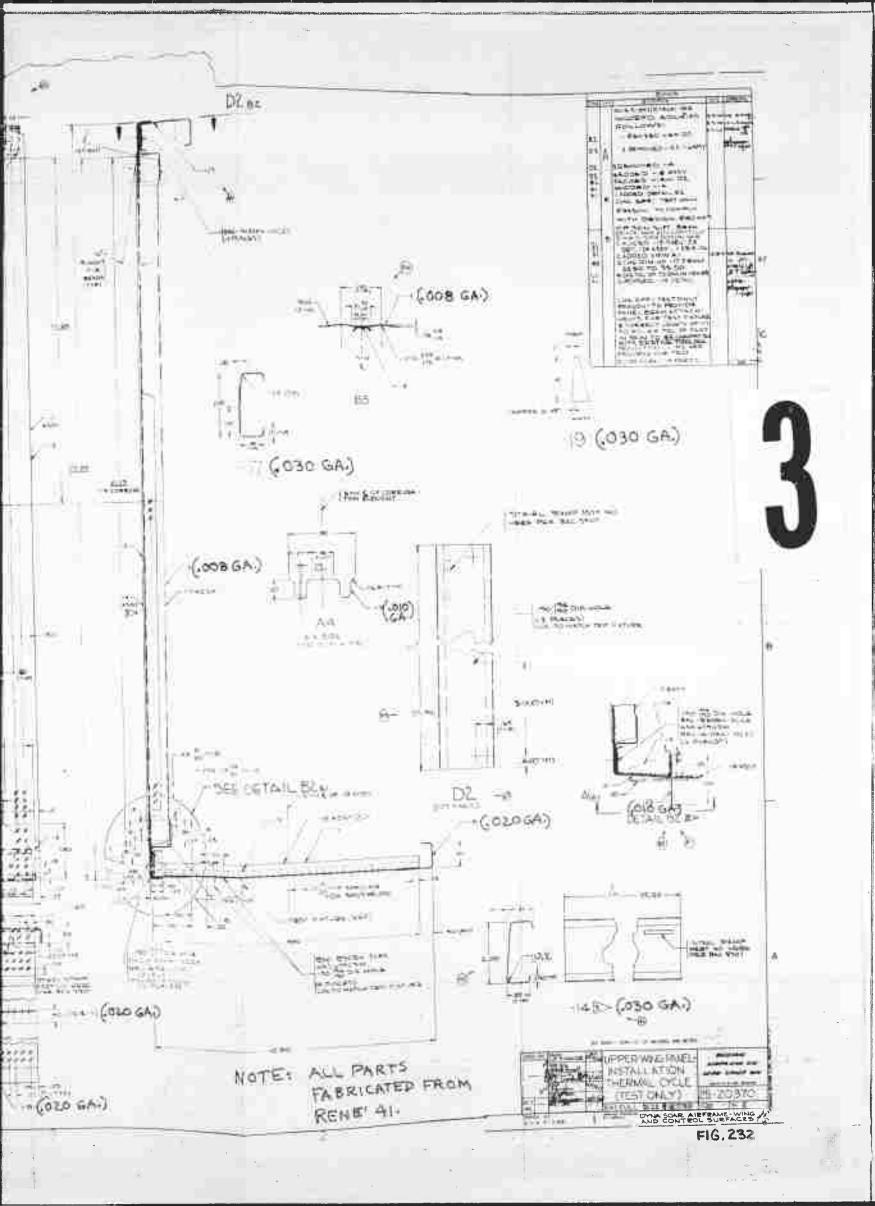
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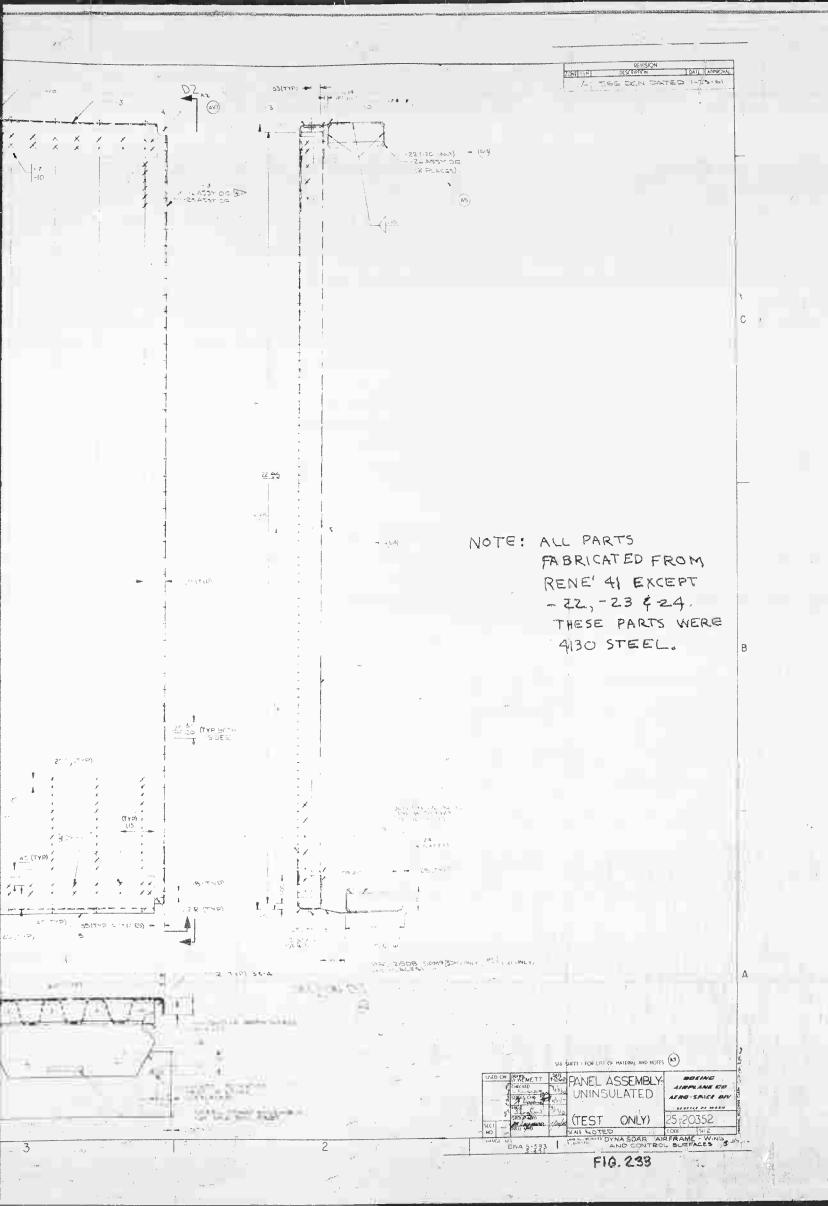


25 (010 GA) 315 115 HOLE (E) -20(.060 GA.) DETAILI -26 (.020 GA) -250 -21 SHOWN (.030 GA) -22 OPP





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